DAIKIN

OPERATION MANUAL

Packaged air-cooled water chillers

EWAQ080DAYN
EWAQ100DAYN
EWAQ130DAYN
EWAQ150DAYN
EWAQ180DAYN
EWAQ210DAYN
EWAQ240DAYN
EWAQ260DAYN

CONTENTS

Page

Introduction 1
- Technical specifications 1
- Electrical specifications 2
- Important information regarding the refrigerant used 3

Description 3
- Function of the main components 4
- Safety devices 5
- Internal wiring - Parts table 6

Before operation 7
- Checks before initial start-up 7
- Water supply 7
- Power supply connection and crankcase heating 7
- General recommendations 7

Operation 8
- Digital controller 8
- Working with the unit 8
- Advanced features of the digital controller 11

Troubleshooting 19

Maintenance 22
- Maintenance activities 22
- Disposal requirements 23

READ THIS MANUAL ATTENTIVELY BEFORE STARTING UP THE UNIT. DO NOT THROW IT AWAY. KEEP IT IN YOUR FILES FOR FUTURE REFERENCE.

INTRODUCTION

This operation manual concerns packaged air-cooled water chillers of the Daikin EWAQ-DAYN series. These units are provided for outdoor installation and used for cooling applications. The EWAQ units can be combined with Daikin fan coil units or air handling units for air conditioning purposes. They can also be used for supplying water for process cooling.

This manual has been prepared to ensure adequate operation and maintenance of the unit. It will tell you how to use the unit properly and will provide help if problems occur. The unit is equipped with safety devices, but they will not necessarily prevent all problems caused by improper operation or inadequate maintenance.

In case of persisting problems contact your local Daikin dealer.

Before starting up the unit for the first time, make sure that it has been properly installed. It is therefore necessary to carefully read the installation manual supplied with the unit and the recommendations listed in "Checks before initial start-up" on page 7.

Technical specifications (1)

General EWAQ		**080**	**100**	**130**
Dimensions HxWxD	(mm)	2311x2000x2631		
Weight				
• machine weight	(kg)	1350	1400	1500
• operation weight	(kg)	1365	1415	1517
Connections				
• chilled water inlet and outlet		3" OD	3" OD	3" OD
• evaporator drain		1/2"G	1/2"G	1/2"G
Internal water volume	(l)	15	15	17
Expansion vessel (only for OPSP, OPTP and OPHP)				
• volume	(l)	35	35	35
• pre-pressure	(bar)	1.5	1.5	1.5
Safety valve water circuit	(bar)	3.0	3.0	3.0
Pump (only for OPSP)				
• type		Vertical in-line pump		
• model (standard)		TP 50-240/2	TP 50-240/2	TP 65-230/2
Compressor				
Type		semi-hermetic scroll compressor		
Qty x model		2x SJ180-4	2x SJ240-4	4x SJ161-4
Speed	(rpm)	2900	2900	2900
Oil type		FVC68D	FVC68D	FVC68D
Oil charge volume	(l)	2x 6.2	2x 6.2	4x 3.3
Condenser				
Nominal air flow	(m^3/min)	780	780	800
No. of motors x output	(W)	4x 500	4x 500	4x 600
Evaporator				
Model		P120T	P120T	DV47

General EWAQ		**150**	**180**	**210**
Dimensions HxWxD	(mm)	2311x2000x2631	2311x2000x3081	
Weight				
• machine weight	(kg)	1550	1800	1850
• operation weight	(kg)	1569	1825	1877
Connections				
• chilled water inlet and outlet		3" OD	3" OD	3" OD
• evaporator drain		1/2"G	1/2"G	1/2"G
Internal water volume	(l)	19	25	27
Expansion vessel (only for OPSP, OPTP and OPHP)				
• volume	(l)	35	35	35
• pre-pressure	(bar)	1.5	1.5	1.5
Safety valve water circuit	(bar)	3.0	3.0	3.0
Pump (only for OPSP)				
• type		Vertical in-line pump		
• model (standard)		TP 65-230/2	TP 65-260/2	TP 65-260/2
Compressor				
Type		semi-hermetic scroll compressor		
Qty x model		4x SJ180-4	2x SJ180-4 + 2x SJ240-4	4x SJ240-4
Speed	(rpm)	2900	2900	2900
Oil type		FVC68D	FVC68D	FVC68D
Oil charge volume	(l)	2x 6.2	2x 6.2 + 2x 6.2	4x 6.2
Condenser				
Nominal air flow	(m^3/min)	860	1290	1290
No. of motors x output	(W)	4x 1000	6x 1000	6x 1000
Evaporator				
Model		DV47	DV58	DV58

(1) Refer to the engineering data book for the complete list of specifications.

General EWAQ		240	260
Dimensions HxWxD	(mm)	2311x2000x4833	
Weight			
• machine weight	(kg)	3150	3250
• operation weight	(kg)	3189	3292
Connections			
• chilled water inlet and outlet		3"	3"
• evaporator drain		1/2"G	1/2"G
Internal water volume	(l)	39	42
Expansion vessel (only for OPSP, OPTP and OPHP)			
• volume	(l)	50	50
• pre-pressure	(bar)	1.5	1.5
Safety valve water circuit	(bar)	3.0	3.0
Pump (only for OPSP)			
• type		Vertical in-line pump	
• model (standard)		TP 65-260/2	TP 65-260/2
Compressor			
Type		semi-hermetic scroll compressor	
Qty x model		2x SJ240-4 + 2x SJ300-4	4x SJ300-4
Speed	(rpm)	2900	2900
Oil type		FVC68D	FVC68D
Oil charge volume	(l)	2x 6.2 + 2x 6.2	4x 6.2
Condenser			
Nominal air flow	(m^3/min)	1600	1600
No. of motors x output	(W)	8x 600	8x 600
Evaporator			
Model		DV58	DV58

Electrical specifications (1)

EWAQ		080	100	130	150
Power supply			YN		
• Phase			3~		
• Frequency	(Hz)		50		
• Voltage	(V)		400		
• Voltage tolerance	(%)		±10		
Unit					
• Nominal running current	(A)	60	72	88	113
• Maximum running current	(A)	96	120	160	177
• Recommended fuses according to IEC 269-2	(A)	3x 125 gL	3x 160 gL	3x 200 gL	3x 200 gL
Compressor					
• Circuit 1	(hp)	15 + 15	20 + 20	13 + 13	15 + 15
Circuit 2	(hp)	—	—	13 + 13	15 + 15
• Phase			3~		
• Frequency	(Hz)		50		
• Voltage	(V)		400		
• Nominal running current					
Circuit 1	(A)	39 + 39	51 + 51	35 + 35	39 + 39
Circuit 2	(A)	—	—	35 + 35	39 + 39
Control and fan motor					
• Phase			1~		
• Frequency	(Hz)		50		
• Voltage	(V)		230 V		
• Maximum running current	(A)	4x 1.5	4x 1.5	4x 1.6	4x 2.3
Pump					
• Power	(kW)	2.2	2.2	3	3
• Nominal running current	(A)	4.5	4.5	6.3	6.3
Heater tape			(OP10)		
• Supply voltage	(V)		230 V ±10%		
• Power (standard)			1x 300 W		
(OPSP)			2x 300 W		
(OPBT)			2x 300 W + 150 W		
• Optional field heater			maximum 1 kW		
• Recommended fuses	(A)		2x 10		

EWAQ		180	210	240	260
Power supply			YN		
• Phase			3~		
• Frequency	(Hz)		50		
• Voltage	(V)		400		
• Voltage tolerance	(%)		±10		
Unit					
• Nominal running current	(A)	131	144	162	181
• Maximum running current	(A)	209	233	262	290
• Recommended fuses according to IEC 269-2	(A)	3x 250 gL	3x 250 gL	3x 300 gL	3x 355 gL
Compressor					
• Circuit 1	(hp)	20 + 15	20 + 20	25 + 20	25 + 25
Circuit 2	(hp)	20 + 15	20 + 20	25 + 20	25 + 25
• Phase			3~		
• Frequency	(Hz)		50		
• Voltage	(V)		400		
• Nominal running current					
Circuit 1	(A)	51 + 39	51 + 51	65 + 51	65 + 65
Circuit 2	(A)	51 + 39	51 + 51	65 + 51	65 + 65
Control and fan motor					
• Phase			1~		
• Frequency	(Hz)		50		
• Voltage	(V)		230 V		
• Maximum running current	(A)	6x 2.3	6x 2.3	8x 1.6	8x 1.6
Pump					
• Power	(kW)	4	4	4	4
• Nominal running current	(A)	8.0	8.0	8.0	8.0
Heater tape			(OP10)		
• Supply voltage	(V)		230 V ±10%		
• Power (standard)			1x 300 W		
(OPSP)			2x 300 W		
(OPBT)			2x 300 W + 150 W		
• Optional field heater			maximum 1 kW		
• Recommended fuses	(A)		2x 10		

Important information regarding the refrigerant used

This product contains fluorinated greenhouse gases covered by the Kyoto Protocol.

Refrigerant type: R410A
GWP[(1)] value: 1975

[(1)] GWP = global warming potential

Periodical inspections for refrigerant leaks may be required depending on European or local legislation. Please contact your local dealer for more information.

DESCRIPTION

The EWAQ air-cooled water chillers are available in 8 standard sizes.

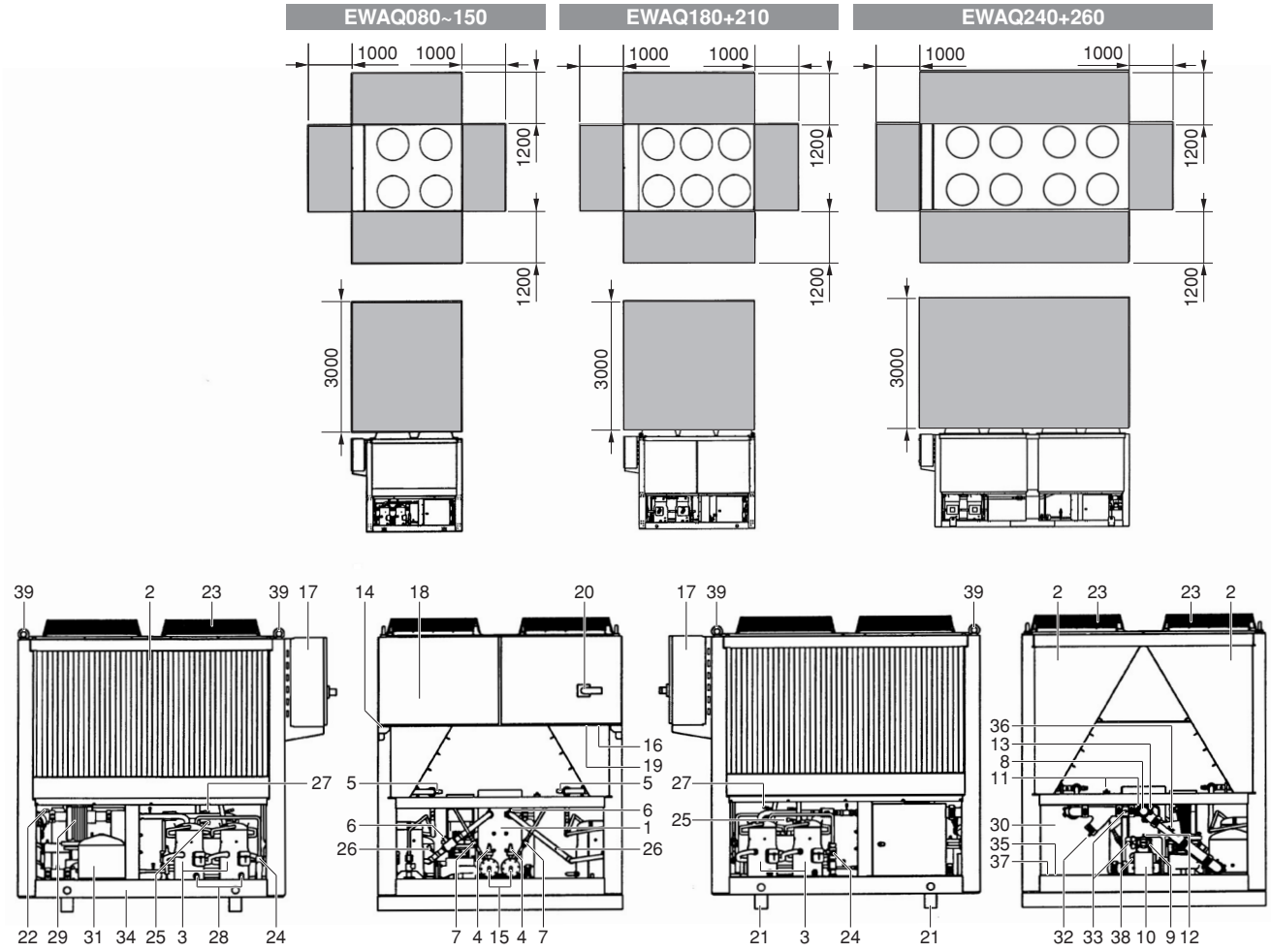


Figure - Main components

1	Evaporator	**14**	Ambient temperature sensor (R1T)	**29**	Pump (optional)
2	Condenser	**15**	Drier + charge valve	**30**	Buffertank (optional)
3	Compressor	**16**	Power supply intake	**31**	Expansion vessel (optional)
4	Electronic expansion valve + sight glass with moisture indication	**17**	Switchbox	**32**	Waterfilter
		18	Digital display controller (behind service panel)	**33**	Water stop valve (optional)
5	Discharge stop valve (optional)			**34**	Frame
6	Suction stop valve (optional)	**19**	Field wiring intake	**35**	Buffertank drain valve
7	Liquid stop valve (optional)	**20**	Main isolator switch	**36**	Regulating valve (optional)
8	Chilled water in (Victaulic® coupling)	**21**	Transportbeam	**37**	Water safety valve (optional)
9	Chilled water out (Victaulic® coupling)	**22**	Flowswitch	**38**	Pressure gauge (optional)
10	Water drain evaporator	**23**	Fan	**39**	Eyebolt (for lifting the unit) (only for EWAQ080~210)
11	Air purge	**24**	Safety valve		
12	Leaving water temperature sensor (R3T)	**25**	High pressure sensor		
		26	Low pressure sensor		
13	Entering water temperature sensor (R2T)	**27**	High pressure switch		Required space around the unit for service and air intake
		28	Oil sight glass		

Function of the main components

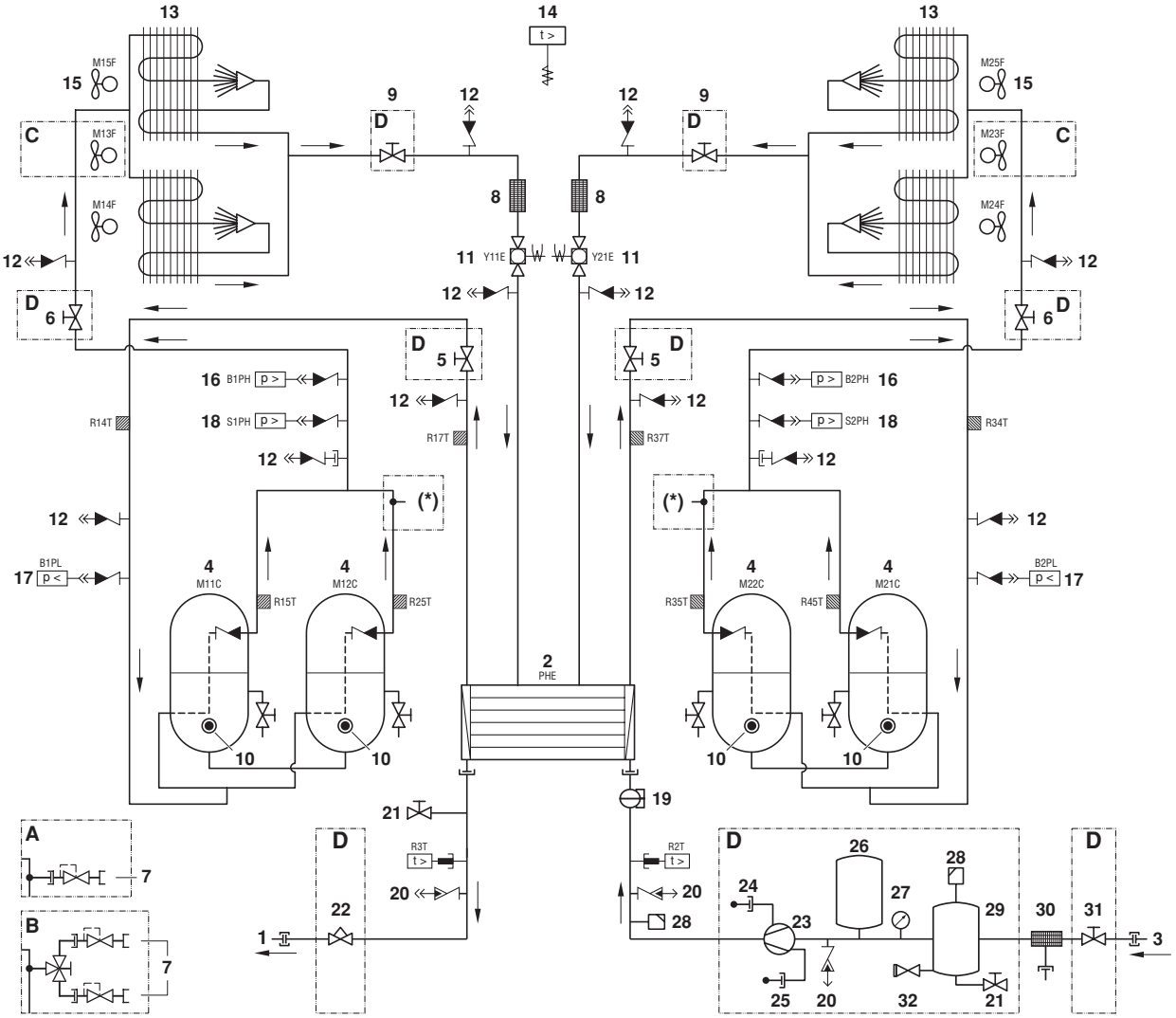


Figure - Functional diagram

1	Water outlet	**11**	Electronic expansion valve + sight glass with moisture indication	**20**	Service port	**30**	Filter
2	Evaporator			**21**	Drain valve	**31**	Shut off valve
3	Water inlet	**12**	Check valve	**22**	Regulating valve	**32**	Water circuit safety valve
4	Compressor	**13**	Condenser	**23**	Pump		
5	Suction stop valve (optional)	**14**	Ambient temperature sensor	**24**	Fill port	**(*)**	Standard (A) or dual pressure relief valve (B)
6	Discharge stop valve (optional)	**15**	Fan	**25**	Drain port		
7	Refrigerant circuit safety valve	**16**	High pressure sensor	**26**	Expansion vessel	**A**	Standard
8	Drier/charge valve	**17**	Low pressure sensor	**27**	Pressure gauge	**B**	Dual pressure relief valve
9	Liquid stop valve (optional)	**18**	High pressure switch	**28**	Air purge	**C**	Only for 70~80 HP units
10	Oil sight glass	**19**	Flowswitch	**29**	Buffer tank	**D**	Optional

As the refrigerant circulates through the unit, changes in its state or condition occur. These changes are caused by the following main components:

- Compressor
  The compressor (M*C) acts as a pump and circulates the refrigerant in the refrigeration circuit. It compresses the refrigerant vapour coming from the evaporator at the pressure at which it can easily be liquefied in the condenser.
- Condenser
  The function of the condenser is to change the state of the refrigerant from gaseous to liquid. The heat gained by the gas in the evaporator is discharged through the condenser to the ambient air, and the vapour condenses to liquid.
- Filter/drier
  The filter installed behind the condenser removes small particles from the refrigerant to prevent damage to the compressor and expansion valve.
  The drier takes the water out of the system.
- Expansion valve
  The liquid refrigerant coming from the condenser enters the evaporator via an expansion valve. The expansion valve brings the liquid refrigerant to a pressure at which it can easily be evaporated in the evaporator.

- Evaporator
  The main function of the evaporator is to take heat from the water that flows through it. This is done by turning the liquid refrigerant, coming from the condenser, into gaseous refrigerant.
- Water in/outlet connection
  The water inlet and outlet connection allow an easy connection of the unit to the water circuit of the air handling unit or industrial equipment.

Safety devices

The unit is equipped with three kinds of safety device:

1 General safety devices

General safety devices shut down all circuits and stop the whole unit. For this reason the unit has to be manually put on again after a general safety occurred.

2 Circuit safety devices

Circuit safety devices shut down the circuit they protect, while the other circuits remain activated.

3 Part safety devices

Part safety devices shut down the part they protect.

An overview of all safety devices is given below.

- Overcurrent relays
  - Overcurrent relay for compressors (only for SJ161-4) (circuit safety device)
    The overcurrent relay protects the compressor motor in case of overload, phase failure or too low voltage.
  - Overcurrent relay for fans (part safety device)
    The overcurrent relay protects the fan motors in case of overload, phase failure or too low voltage.
  - Overcurrent relay for pump (general safety device)
    The overcurrent relay protects the pump in case of overload, phase failure or too low voltage.

  When activated, the overcurrent relays have to be reset in the switch box and the controller needs to be reset manually.

  ⚠ The overcurrent relays are factory set and may not be adjusted.

- Compressor SJ161-4 thermal protector (part safety devices)
  Compressor SJ161-4 is equipped with an internal overload motor protection to protect the unit against excessive current and temperature caused by overloading, low refrigerant flow or phase loss. The compressor will shut down and will automatically restart when temperature returns to normal. This is not detected by the controller.
- Compressor SJ180-4 electronic protection module (circuit safety device)
  Compressor SJ180-4 is equipped with an electronic protection module to provide for efficient and reliable protection against overheating, overloading, and phase loss. The controller will detect the shut down of the compressor. The controller needs to be reset manually. The compressor is internally protected against reverse phase.
- Compressors SJ240-4 and SJ300-4 electronic protection modules (circuit safety device)
  Compressors SJ240-4 and SJ300-4 are equipped with an electronic protection module to provide for efficient and reliable protection against overheating, overloading, phase loss and phase reversal. The controller will detect the shut down of the compressor. The controller needs to be reset manually.
- Reverse phase protector (general safety device)
  The reverse phase protectors prevent the unit from being operated in reverse phase. If the unit does not start, two phases of the power supply must be inverted.
- Flowswitch (general safety devices)
  The unit is protected by a flowswitch (S1L).
  When the water flow becomes lower than the minimum allowed water flow, the flowswitch shuts down the unit. When the water flow becomes normal, the protection resets automatically but the controller still needs to be reset manually.
- Discharge thermal protectors (circuit safety devices)
  The unit is equipped with discharge thermal protectors (R*T). The protectors are activated when the temperature of the refrigerant leaving the compressor becomes too high. When the temperature returns to normal the controller needs to be reset manually.
- Freeze-up protection (general safety devices)
  The freeze-up protection prevents the water in the evaporator from freezing during operation.
  - When the outlet water temperature is too low, the controller shuts down the compressors. When the outlet water temperature returns to normal, the controller resets automatically.
  - When the refrigerant temperature is too low, the controller shuts down the unit. When the refrigerant temperature returns to normal, the controller needs to be reset manually.
- Low pressure safety (circuit safety devices)
  When the suction pressure of a circuit is too low, the circuit controller shuts down the circuit. When the pressure returns to normal, the safety device can be reset on the controller.
- Pressure relief safety valve (general safety devices)
  The safety valve is activated when the pressure in the refrigerant circuit becomes too high. If this occurs, shut down the unit and contact your local dealer.
- High pressure setback (circuit safety device)
  The high pressure setback prevents the high pressure to become too high so that high pressure switch is activated.
  When the high pressure is too high, the controller shuts down the compressor. When the pressure returns to normal, the controller resets automatically.
- High pressure switch (circuit safety devices)
  Each circuit is protected by a high pressure switch (S*PH) which measures the condenser pressure (pressure at the outlet of the compressor).
  When the pressure becomes too high, the pressure switch is activated and the circuit stops.
  When the pressure becomes normal again, the protection resets automatically but the controller still needs to be reset manually.
  The switch is factory-set and may not be adjusted.

Internal wiring - Parts table

Refer to the internal wiring diagram supplied with the unit. The abbreviations used are listed below:

A01P..... PCB extension
A02P.....**..... PCB communication (only for option EKACPG)
A4P..... PCB wired remote controller
A5P.....**..... PCB wired remote controller (only for option EKRUPG)
A11P,A21P..... PCB main controller circuit 1, circuit 2
A13P,A23P....**..... Frequency inverter circuit 1, circuit 2 (only for option OPIF)
A71P..... PCB EEV driver
B1PH,B2PH..... High pressure sensor circuit 1, circuit 2
B1PL,B2PL..... Low pressure sensor circuit 1, circuit 2
DS1..... PCB DIP-switch
E1HS .....## .... Switch box heater with fan (only for EWAQ130~260 with option OPIF)
E3H.....**..... Heater tape (only for option OP10)
E4H.....**..... Heater tape (only for options OP10, OPSP, OPHP and OPTP)
E5H.....*..... Fieldheater
E6H.....**..... Buffertank heater (only for option OP10 and OPBT)
E7H.....## .... Switch box heater (only for EWAQ080+100 with option OPIF)
E11HC,E12HC ..... Crankcase heater compressor circuit 1
E21HC,E22HC ..... Crankcase heater compressor circuit 2 (only for EWAQ130~260)
F1~F3 .....# ..... Main fuses
F1U..... Fuse PCB
F4,F5 .....# ..... Fuse for heater
F6B..... Autofuse for primary of TR1
F8B.....**..... Autofuse for switchbox heater (only for option OPIF)
F9B..... Autofuse for secondary of TR1
F11B,F12B ..... Autofuse for compressors (M11C, M12C) (only for EWAQ130~260)
F14B,F24B ..... Autofuse for fanmotors circuit 1, circuit 2
F15B,F25B ...**..... Autofuse for fanmotors circuit 1, circuit 2 (only for option OPIF)
F16B.....## .... Autofuse for pump (K1P) (only for options OPSP, OPHP, OPTC, OPTP and OPSC)
F17B.....## .... Autofuse for pump (K2P) (only for options OPTC and OPTP)
F21B,F22B ..... Autofuse for compressors (M21C, M22C) (only for EWAQ130~260)
H1P~H6P .....*..... Indication lamp for changeable digital outputs
H11P,H12P ..... Indication lamp for operation compressor circuit 1 C11M, C12M
H21P,H22P ..... Indication lamp for operation compressor circuit 2 C21M, C22M (only for EWAQ130~260)
HAP~HEP..... LED PCB
K1A,K2A..... Auxiliary relay for compressor safety circuit 1, circuit 2
K1P.....## .... Pump contactor (only for options OPSP, OPHP, OPTC, OPTP and OPSC)
K1R~K22R ..... PCB relay
K1S.....*..... Overcurrent relay pump
K2P.....## .... Pump contactor (only for options OPTC and OPTP)
K3A..... Auxiliary relay for heater tape
K11M,K12M..... Compressor contactor for circuit 1
K13F,K14F..... Fancontactor for circuit 1
K13S,K14S..... Fan overcurrent relay for circuit 1
K15F..... Fancontactor for circuit 1 (only for EWAQ080+100 and EWAQ180~260)
K15S..... Fan overcurrent relay for circuit 1 (only for EWAQ080+100 and EWAQ180~260)
K16F..... Fancontactor for circuit 1 (only for EWAQ080+100 and EWAQ240+260)
K16S..... Fan overcurrent relay for circuit 1 (only for EWAQ080+100 and EWAQ240+260)
K21M,K22M ..... Compressor contactor for circuit 2 (only for EWAQ130~260)
K23F,K24F ..... Fancontactor for circuit 2 (only for EWAQ130~260)
K23S,K24S ..... Fan overcurrent relay for circuit 2 (only for EWAQ130~260)
K25F ..... Fancontactor for circuit 2 (only for EWAQ180~260)
K25S ..... Fan overcurrent relay for circuit 2 (only for EWAQ180~260)
K26F ..... Fancontactor for circuit 2 (only for EWAQ240+260)
K26S ..... Fan overcurrent relay for circuit 2 (only for EWAQ240+260)
M1P..... * ..... Pump motor 1 (only for options OPSP, OPHP, OPTC and OPTP)
M2P..... * ..... Pump motor 2 (only for options OPTC and OPTP)
M11C,M12C..... Compressor motors circuit 1
M13F,M14F ..... Fan motors circuit 1
M15F..... Fan motors circuit 1 (only for EWAQ080+100 and EWAQ180~260)
M16F..... Fan motors circuit 1 (only for EWAQ080+100 and EWAQ240+260)
M21C,M22C..... Compressor motors circuit 2 (only for EWAQ130~260)
M23F,M24F ..... Fan motors circuit 2 (only for EWAQ130~260)
M25F..... Fan motor circuit 2 (only for EWAQ180~260)
M26F..... Fan motor circuit 2 (only for EWAQ240+260)
PE ..... Main earth terminal
Q1T ..... **..... Thermostat (only for option OP10)
Q11C,Q12C ..... Thermal protector compressor circuit 1 (only for EWAQ130)
Q11C,Q12C ..... Electronic protection module compressor circuit 1 (not for EWAQ130)
Q21C,Q22C ..... Thermal protector compressor circuit 2 (only for EWAQ130)
Q21C,Q22C ..... Electronic protection module compressor circuit 2 (only for EWAQ150~260)
R1T ..... Ambient temperature sensor
R2T ..... Inlet water temperature sensor
R3T ..... Outlet water temperature sensor
R8T ..... * ..... Temperature sensor for changeable analogue input
R14T ..... Suction temperature sensor circuit 1
R15T,R25T..... Discharge temperature sensor circuit 1
R17T ..... Refrigerant piping temperature sensor circuit 1
R34T ..... Suction temperature sensor circuit 2 (only for EWAQ130~260)
R35T,R45T..... Discharge temperature sensor circuit 2 (only for EWAQ130~260)
R37T ..... Refrigerant piping temperature sensor circuit 2 (only for EWAQ130~260)
S1A~S3A ..... PCB DIP-switch
S1L..... Flowswitch
S1M..... Main isolator switch
S1PH,S2PH ..... High pressure switch circuit 1, circuit 2
S1S~S5S ..... * ..... Switch for changeable digital input
S1T ..... ##..... Thermal contact (only for option OPIF)
S2M..... #..... Heater tape isolator switch
T1A ..... **..... Current transducer (only for option OP57)

T1V..... ** .....Voltage transducer (only for option OP57)
TR1 .....Transfo control circuit (400 V/230 V)
TR1A..... ** .....Current measurement transfo (only for option OP57)
V1C .....Ferrite core
V1F,V2F..... ** .....Noise filter circuit 1, circuit 2 (only for EWAQ130~210 with option OPIF)
V2C ..... ** .....Ferrite core (only for option EKACPG)
X*A.....PCB terminal
X*Y.....Connector
X1M.....PCB terminal strip
Y11E .....Electronic expansion valve cooling circuit 1
Y21E .....Electronic expansion valve cooling circuit 2 (only for EWAQ130~260)

	Not included with standard unit	
	Not possible as option	Possible as option
Obligatory	#	##
Not obligatory	*	**

BEFORE OPERATION

Checks before initial start-up

Make sure that the circuit breaker on the power supply panel of the unit is switched off.

After the installation of the unit, check the following before switching on the circuit breaker:

1 Field wiring

Make sure that the field wiring between the local supply panel and the unit has been carried out according to the instructions described in the installation manual, according to the wiring diagrams and according to European and national regulations.

2 Fuses or protection devices

Check that the fuses or the locally installed protection devices are of the size and type specified in the installation manual. Make sure that neither a fuse nor a protection device has been bypassed.

3 Earth wiring

Make sure that the earth wires have been connected properly and that the earth terminals are tightened.

4 Internal wiring

Visually check the switch box for loose connections or damaged electrical components.

5 Fixation

Check that the unit is properly fixed, to avoid abnormal noises and vibrations when starting up the unit.

6 Damaged equipment

Check the inside of the unit for damaged components or squeezed pipes.

7 Refrigerant leak

Check the inside of the unit for refrigerant leakage. If there is a refrigerant leak, call your local dealer.

8 Oil leak

Check the compressor for oil leakage. If there is an oil leak, call your local dealer.

9 Stop valves

Open the liquid line, discharge and suction stop valves (if provided) completely.

10 Air inlet/outlet

Check that the air inlet and outlet of the unit is not obstructed by paper sheets, cardboard, or any other material.

11 Power supply voltage

Check the power supply voltage on the local supply panel. The voltage should correspond to the voltage on the identification label of the unit.

12 Water connection

Check water piping system and circulating pumps.

Water supply

Fill the water piping, taking into account the minimum water volume required by the unit. Refer to the "installation manual".

Make sure that the water is of the quality as mentioned in the installation manual.

Purge the air at the high points of the system and check the operation of the circulation pump and the flowswitch.

Power supply connection and crankcase heating

In order to avoid compressor damage, it is necessary to switch on the crankcase heater for **at least 6 hours** before starting the compressor after a long period of standstill.

To switch on the crankcase heater proceed as follows:

1 Switch on the circuit breaker on the local supply panel. Make sure that the unit is "OFF".

2 The crankcase heater is switched on automatically.

3 Check the supply voltage on the supply terminals L1, L2, L3 by means of a voltmeter. The voltage must correspond to the voltage indicated on the identification label of the unit. If the voltmeter reads values which are not within the ranges specified in the technical data, check the field wiring and replace the supply cables if necessary.

4 Check if the crankcase heaters are warming up.

After 6 hours, the unit is ready for operation.

General recommendations

Before switching on the unit, read following recommendations:

1 When the complete installation and all necessary settings have been carried out, close all service panels of the unit.

2 The service panels of the switch boxes may only be opened by a licensed electrician for maintenance purposes.

3 When accessibility to the digital controller is frequently necessary, install an optional digital remote controller (EKRUPG).

4 To prevent the evaporator from freezing (when OP10 is installed) and to avoid damage to the LCD displays of the digital controller, never switch off the power supply during winter.

OPERATION

The EWAQ units are equipped with a digital controller (located behind the service panel) offering a user-friendly way to set up, use and maintain the unit.

This part of the manual has a task-oriented, modular structure. Apart from the first section, which gives a brief description of the controller itself, each section or subsection deals with a specific task you can perform with the unit.

Depending on the unit there are one or two cooling circuits in the system. The units EWAQ130~260 exist out of two circuits, whereas the units EWAQ080+100 only have one circuit. These circuits are generally named C1 and C2 in the following descriptions. So all information about circuit 2 (C2) is not applicable for EWAQ080+100 units.

Digital controller

User interface

The digital controller consists of an alphanumeric display, labelled keys which you can press and a number of LEDs.

- Digital controller and digital remote controller (EKRUPG)

Figure - Digital (remote) controller

- key, to start up or to shut down the unit.
- key, to enter the safeties menu or to reset an alarm.
- key, to enter the main menu
- keys, to scroll up or down through the screens of a menu (only in case ^, v or ÷ appears) or to raise, respectively lower a setting.
- key, to confirm a selection or a setting.

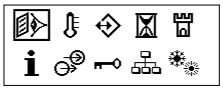
NOTE

Temperature readout tolerance: ±1°C.

Legibility of the alphanumeric display may decrease in direct sunlight.

How to enter a menu

Scroll through the main menu using the ▲ and ▼ keys to go to the menu of your choice. Push the ↵ key to enter the selected menu.



Menu		Not selected	Selected
Readout menu	=		
Setpoints menu	=		
Usersettings menu	=		
Timers menu	=		
History menu	=		
Info menu	=		
I/O status menu	=		
Login/logout menu	=		
Network menu	=		
Cool/heat menu	=		

- Access to the setpoints menu ( ) and the usersettings menu ( ) is protected by a password, refer to "Changing the user password" on page 19.
- The cool/heat menu is not available for EWAQ units.

Connection of a remote digital controller to the unit

For a remote digital controller a cable length of up to 500 metres between the remote digital controller and the unit is allowed. This gives the opportunity to control the unit from a considerable distance. Refer to "Cable for remote digital controller" in the installation manual for cable specifications.

These restrictions are the same for units in a DICN configuration.

NOTE

When a remote digital controller is connected to a stand-alone unit, the address of the remote digital controller has to be set to SUB by means of the DIP-switches on the back of the remote digital controller. Refer to the installation manual "Setting the addresses on the remote digital controller" for setting the address.

Working with the unit

This chapter deals with the everyday usage of the unit. Here, you will find how to perform routine tasks, such as:

- "Setting the language" on page 8
- "Switching the unit on" on page 8
- "Consulting actual operational information" on page 9
- "Adjusting the temperature setpoint" on page 10
- "Resetting the unit" on page 10

Setting the language

If desired, the operating language can be changed to any of the following languages: English, German, French, Spanish or Italian.

1 Enter the usersettings menu. Refer to chapter "How to enter a menu" on page 8.

2 Go to the Language submenu of the usersettings menu using the ▲ and ▼ keys and press the ↵ key to enter.

3 Press ↵ to change the operating language until the desired language is active.

The controller is factory set to English.

Switching the unit on

1 Press the ⏻ key on the controller.

NOTE

If the password protection is set to ON, the correct password has to be given before any further action is possible.

Depending on whether or not a remote ON/OFF switch has been configured (refer to the installation manual), the following conditions may occur.
When no remote ON/OFF switch is configured, the LED inside the ⏻ key lights up and an initialization cycle is started. Once all the timers have reached zero, the unit starts up.
When a remote ON/OFF switch is configured, the following table applies:

Local key	Remote ON/OFF switch	Unit	⏻ LED
ON	ON	ON	ON
ON	OFF	OFF	Flashing
OFF	ON	OFF	OFF
OFF	OFF	OFF	OFF

2 If the water chiller does not start after a few minutes, refer to "Troubleshooting" on page 19.

Switching the unit off

If no remote on/off switch is configured:
Press the ⏻ key on the controller.
The LED inside the ⏻ key goes out.

If a remote on/off switch is configured:
Press the ⏻ key on the controller or switch the unit off using the remote on/off switch.
The LED inside the ⏻ key goes out in the first case and starts blinking in the second case.

NOTE Also consult "Customization in the service menu" chapter "Setting of the changeable inputs and outputs" in the installation manual.

Switching units ON/OFF in a DICN system

If the ⏻ key is pressed on a unit with status **NORMAL** or **STANDBY**, all other units with status **NORMAL** or **STANDBY** will be ON or OFF.

If the ⏻ key is pressed on a unit with status **DISCONNECT ON/OFF**, only this unit will be ON or OFF.

NOTE When a remote ON/OFF switch is configured, the remote ON/OFF contact for all units with status **NORMAL** or **STANDBY** of a DICN network is the contact connected to the master unit.

For units with status **DISCONNECT ON/OFF**, the remote contact is the contact connected to this unit.

NOTE If the user wants 1 unit to operate on his command only, this unit is to be set to **DISCONNECT ON/OFF**.

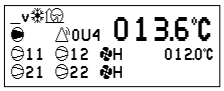
It is recommended not to select the master unit for this purpose. Even if the status of the master is set to **DISCONNECT ON/OFF**, it will still be the contact connected to the master which will switch ON/OFF the other units in **NORMAL** or **STANDBY** mode. It would therefore never be possible to only switch the master unit OFF remotely.

Switching OFF the master unit only, should in this case be done by the local ON/OFF key on the master unit.

Consulting actual operational information

1 Enter the readout menu. Refer to the chapter "How to enter a menu" on page 8.

The controller automatically shows the first screen of the readout menu which provides the following information:



- ❄ cooling mode
- ☀ heating mode
- fan (**H** high or **L** low)
- low noise mode activated (only available when option OPIF is installed)
- pump on
- **1/2** in case of dual pump control: pump 1/2 on
- **11/12** circuit 1 compressor 1/2 on
- **21/22** circuit 2 compressor 1/2 on
- △ alarm and last occured malfunction code (**0U4** in example)
- **13.6℃** actual temperature (inlet or outlet temperature depending on active mode)
- **12.0℃** temperature setpoint (inlet or outlet temperature depending on active mode)

2 Press the ▼ key to enter the next screen of the readout menu.

- **MANUAL MODE** or **COOL INLSP1/2** or **COOL OUTLSP1/2**: manual/automatic control mode operation. If the automatic control mode is selected, the controller will indicate the active temperature setpoint. Depending on the status of the remote contact, setpoint one or setpoint two is active.
- **INL WATER**: actual inlet water temperature.
- **OUTL WATER**: actual outlet water temperature.
- **AMBIENT**: actual ambient temperature.

NOTE For a DICN system, the **INLET WATER** and **OUTLET WATER** values are the values of the individual units, not of the system. Temperatures of the system can be consulted in the first screen of the network menu.

3 Press the ▼ key to enter the next screen of the readout menu.

The **TEMPERATURE** screen of the readout menu provides information concerning the discharge temperature of the compressors (**C11** and **C12**/**C21** and **C22**).

4 Press the ▼ key to enter the next screen of the readout menu.

The **C1/C2 TEMP. READOUT** screen of the readout menu provides information concerning the refrigerant temperature (**REFR**) of circuit 1/circuit 2.

5 Press the ▼ key to enter the next screen of the readout menu.

The **ACT. PRESSURES** screen of the readout menu provides information concerning the actual pressures of circuit.

- **HP1/2**: high pressure of the refrigerant in circuit 1/2. The first number stands for the pressure in bar, the second number stands for the bubble point saturation temperature in degrees Celsius.
- **LP1/2**: low pressure of the refrigerant in circuit 1/2. The first number stands for the pressure in bar, the second number stands for the dew point saturation temperature in degrees Celsius.
- **LOWNOISE**: at the bottom of the first screen, the status of the lownoise setting is shown (**Y**=active or **N**=not active).

6 Press the ▼ key to enter the next screen of the readout menu.

The **UNIT STATUS** screen of the readout menu provides information concerning the status of the different circuits.

- **C11** and **C12**: actual status of circuit 1 (**ON** or **OFF**).
- **C21** and **C22**: actual status of circuit 2 (**ON** or **OFF**).

When the unit is on and a circuit is **OFF**, the following status information may appear.

- **SAFETY ACT.**: one of the circuit safety devices is activated (refer to "Troubleshooting" on page 19).
- **FREEZEUP DIS**: the compressor is disabled by the freeze-up disable function.
- **FREEZEUP PR**: freeze-up prevention is active.
- **HP SETBACK**: high pressure setback is active.
- **MIN.RUN.TIM**: minimum running time of the compressor is active.
- **LIMIT**: the compressor is limited by the limitation function.
- **STANDBY DICN**: when in a DICN configuration, the unit is in stand by mode because there is sufficient current capacity to maintain set point.
- **UNIT OFF**: the unit is switched off.
- **AREC INLET**: the compressor will not start up when the inlet water temperature has not risen enough compared to previous switch off of the compressor.
- **FREE COOLING**: free cooling mode is active
- **TIMER BUSY**: the actual value of one of the compressor timers is not zero (refer to "Timers menu ☒" on page 12).
- **PUMPLEAD TIM**: the compressor will wait to start up for as long as the pump lead timer is counting down.
- **NO FLOW**: there is no flow after pumplead, the unit is in stand-by mode.
- **NO PRIORITY**: This compressor will not start up because it has no priority. Refer to "Defining the lead-lag settings" on page 15 for adjusting the priority.

- CAN STARTUP: the circuit is ready to start up when extra cooling load is needed.
- When none of the above mentioned messages appears, no special functions are active and the compressor is running.

The preceding messages are written down in order of priority.
The UNIT CAPACITY is written down on the bottom of the first screen.

7 Press the ▼ key to enter the next screen of the readout menu.

The EXTRA READOUT screens of the readout menu are providing the following information:

- CURRENT: actual current, measured in Ampere (A) (only when OP57 is installed)
- VOLTAGE: actual voltage (V) (only when OP57 is installed)
- RH11/12/21/22: actual running hours (h)
- CS11/12/21/22: number of compressor start-ups
- RHP1/2: actual running hours (h) of the pump 1 or 2

8 Press the ▲ key to return to the other readout menus.

Adjusting the temperature setpoint

The unit provides definition and selection of four independent temperature setpoints. Two setpoints are reserved for inlet control, the other two are reserved for outlet control.

- COOL. INLSP1: inlet water temperature, setpoint 1,
- COOL. INLSP2: inlet water temperature, setpoint 2.
- COOL. OUTSP1: outlet water temperature, setpoint 1,
- COOL. OUTSP2: outlet water temperature, setpoint 2.

The selection between setpoint 1 and 2 is done by a remote dual setpoint switch (to be installed by the customer). The actual active setpoint can be consulted in the readout menu.

NOTE The customer is also allowed to define a setpoint in function of an analogue input.

NOTE Refer to "Customization in the service menu" chapter "Setting of the changeable inputs and outputs" in the installation manual

If the manual control mode is selected (refer to "Usersettings menu" on page 11), none of the above-mentioned setpoints will be active.

To adjust a setpoint, proceed as follows:

1 Enter the setpoints menu. Refer to the chapter "How to enter a menu" on page 8.

If the user password is disabled for setpoint modifications (refer to "Usersettings menu" on page 11), the controller will immediately enter the setpoints menu.
If the user password is enabled for setpoint modifications, enter the correct code using the ▲ and ▼ keys (refer to "User password menu" on page 14). Press ↵ to confirm the password and to enter the setpoints menu.

2 Select the setpoint to be adjusted using the ↵ key.

A setpoint is selected when the cursor is blinking behind the setpoint's name.
The ">" sign indicates the actual active temperature setpoint.

3 Press the ▲ and ▼ keys to adjust the temperature setting.

The default, limit and step values for the cooling temperature setpoints are:

	COOLING INLET SETP	COOLING OUTLET SETP
default value	12°C	7°C
limit values(*)	7 → 23°C	4 → 20°C
step value	0.1°C	0.1°C

(*) For glycol treated units with OPZH installed, the lower limit of the cooling temperature setpoint can be adapted by changing the minimum operating temperature in the service menu (refer to the installation manual).

4 Press ↵ to save the adjusted temperature setpoint.

When the setting has been confirmed, the cursor switches to the next setpoint.

5 To adjust other setpoints, repeat from step 2.

NOTE When a setpoint on a unit in a DICN system is set, this setpoint will be transferred to all other units.

NOTE Also consult "Defining the floating setpoint settings" on page 15.

Resetting the unit

The units are equipped with three kinds of safety devices: unit safeties, circuit safeties and network safeties.

When a unit or circuit safety occurs, the compressor is shut down. The safeties menu will indicate which safety is activated. The UNIT STATUS screen of the readout menu will indicate OFF – SAFETY ACTIVE. The red LED inside the 🔔 key lights up and the buzzer inside the controller is activated.

When a network safety occurs in a DICN configuration, the slaves not detected by the network will function as stand alone units.

- If a slave unit can not be found by the network, the red light inside the 🔔 key of the master lights up and the buzzer inside the control is activated.
- If the master can not be found by the network, the red light inside the 🔔 key of all the slaves light up and the buzzer inside their controls are activated. All units will work as stand alone units.

If the unit has been shut down due to a power failure, it will carry out an autoreset and restart automatically when the electrical power is restored.

To reset the unit, proceed as follows:

1 Press the 🔔 key to acknowledge the alarm.

The buzzer is deactivated.
The controller automatically switches to the corresponding screen of the safeties menu: unit safety or circuit safety or network safety.

2 Find the cause of shutdown and correct.

Refer to "Listing activated safeties and checking the unit status" on page 17 and "Troubleshooting" on page 19.
When a safety can be reset, the LED under the 🔔 key starts blinking.

3 Press the 🔔 key to reset the safeties that are no longer active.

If required, enter the USER PASSWORD or the SERVICE PASSWORD. (Refer to the installation manual "Setting the password for safety reset".)
Once all safety devices are deactivated and reset, the LED under the 🔔 key goes out. If one of the safeties is still active, the LED under the 🔔 key goes on again. In this case, return to step 2.

4 It will only be necessary to switch the ⏻ key on again if a unit safety occurs.

⚠ If the user shuts down the power supply in order to repair a safety, the safety will automatically be reset after power-up.

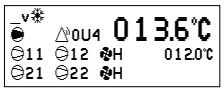
NOTE The history information, i.e. the number of times a unit safety or a circuit safety occurred and the unit status at the moment of shutdown, can be checked by means of the history menu.

Advanced features of the digital controller

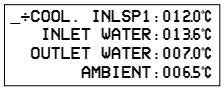
This chapter gives an overview and a brief functional description of the screens provided by the different menus. In the following chapter, you will find how you can set up and configure the unit using the various menu functions.

All menus are directly accessible using the corresponding key on the digital controller or through the main menu (refer to "How to enter a menu" on page 8). The down arrow v on the display indicates that you can go to the next screen of the current menu using the ▼ key. The up arrow ^ on the display indicates that you can go to the previous screen of the current menu using the ▲ key. If ÷ is displayed, this indicates that you can either return to the previous screen or can go to the next screen.

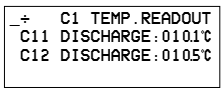
Readout menu



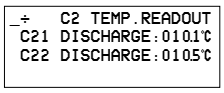
To consult actual operational information about the status of the pump, the compressor and the fans and the temperature setpoint (depending on active mode).



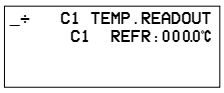
To consult actual operational information about the control mode, the inlet and outlet water temperature.
Note that for a DICN system, the INLET WATER and OUTLET WATER values are the values of the individual units, not of the system. Temperatures of the system can be consulted in the first screen of the network menu.



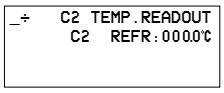
To consult information about the discharge temperature of circuit 1.



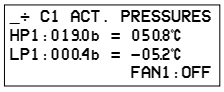
To consult information about the discharge temperature of circuit 2 (only for EWAQ130~260).



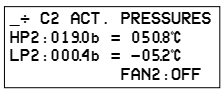
To consult information about the temperature of the refrigerant of circuit 1.



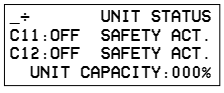
To consult information about the temperature of the refrigerant of circuit 2 (only for EWAQ130~260).



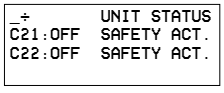
To consult information about the actual pressures and the fans of circuit 1 and to check if the fans are running in lownoise mode.



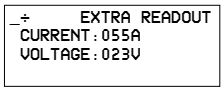
To consult information about the actual pressures and the fans of circuit 2 (only for EWAQ130~260).



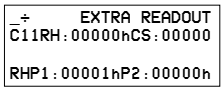
To consult information about the unit status of circuit 1 and the capacity of the unit.



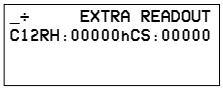
To consult information about the unit status of circuit 2 (only for EWAQ130~260).



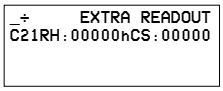
To consult actual operational information about the current (Ampere) and voltage of the unit.



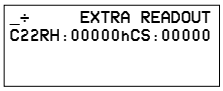
To consult actual operational information about the total running hours and the number of compressor stops of circuit 1 (first screen) and total running hours of the pumps.



To consult actual operational information about the total running hours and the number of compressor stops of circuit 1 (second screen).



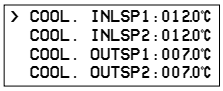
To consult actual operational information about the total running hours and the number of compressor stops of circuit 2 (first screen) (only for EWAQ130~260).



To consult actual operational information about the total running hours and the number of compressor stops of circuit 2 (second screen) (only for EWAQ130~260).

Setpoints menu

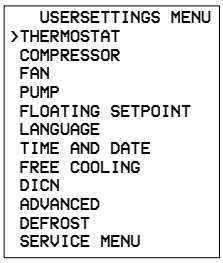
Depending upon the settings in the "advanced" usersettings menu, the "setpoints" menu can either be entered directly or by means of the user password.



To define the temperature setpoints.

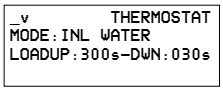
Usersettings menu

The "usersettings" menu, protected by the user password, allows a full customization of the units.

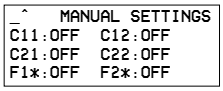


Use the ▲ and ▼ keys to scroll through the menu and press the ↵ key to enter the submenu of your choice.

THERMOSTAT

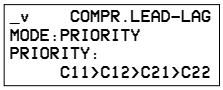


To define the thermostat settings.

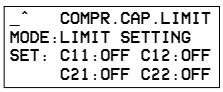


To define the settings for manual control.

COMPRESSOR

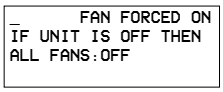


To define the compressor lead-lag settings.



To define the compressor capacity limitation settings.

FAN



To define the action on all the fans in case the unit is off.

PUMP

```
_v       PUMPCONTROL
PUMPLEADTIME    :020s
PUMPLAGTIME     :060s
DAILY ON:N  AT:12h00
```

To define the pump control settings.

```
_^         DUAL PUMP
MODE:AUTO ROTATION
OFFSET ON RH    :048h
```

To define the dual pump settings.

FLOATING SETPOINT

```
_  FLOATING SETPOINT
MODE:AMBIENT
MAXPOS:030°C NEG:000°C
RF:020.0°C SLOPE:006.0°C
```

To define the floating setpoint.

LANGUAGE

```
_           LANGUAGE
PRESS ENTER TO
CHANGE LANGUAGE:
ENGLISH
```

To define the controller display language.

TIME AND DATE

```
_       TIME AND DATE
TIME: 22h35
DATE FORMAT:DD/MM/YY
DATE: MON   20/03/06
```

To set the time and date of the system.

FREE COOLING

```
_        FREE COOLING
MODE:AMBIENT
SP: 05.0°C  DIF:01.0°C
PUMP:ON  LEAD:000s
```

To define the free cooling.

DICN

```
_÷   MASTER SETTINGS
MODE:NORMAL
OFFSET:0000h
PUMP ON IF:UNIT ON
```

The controller displays the name of the unit: **MASTER**, **SLAVE1** ... **SLAVE3**. This name is automatically assigned depending on the set hardware address. Refer to "Setting the addresses" in "Connection and setup of a DICN system" in the installation manual.

ADVANCED

```
_v          ADVANCED
PASSWORD NEEDED FOR:
     SETPOINT MENU:Y
       UNIT ON/OFF:Y
```

To define whether or not a password is needed to enter the setpoints menu and for switching the unit on and off.

```
_^          ADVANCED
MAIN MENU:GRAPHIC
LOGOUT TIMER  :05min
BUZZER IF SAFETY:YES
```

To define the outlook of the main menu, to set the logout timer and to define whether or not the buzzer is to be activated when errors occur.

```
_^          ADVANCED
BACKLIGHT TIME:05min
GRAPHIC READOUT:YES
```

To define the backlight time and to define whether or not graphic readout is activated.

DEFROST

This submenu is not available for EWAQ units.

SERVICE MENU

```
ENTER SERVICE

  PASSWORD: 0000
  TO LOGIN
```

To enter the service menu (only a qualified installer is allowed to access this menu).

Timers menu

```
_v    GENERAL TIMERS
LOADUP:000s-DWN:000s
PUMPLEAD    :000s
FLOWSTOP    :00s
```

To check the actual value of the general software timer.

```
_÷ COMPRESSOR TIMERS
 GRD11:000s 12:000s
AREC11:000s 12:000s
M.RT11:000s 12:000s
```

To check the actual value of the compressor timers of circuit 1.

```
_^ COMPRESSOR TIMERS
 GRD21:000s 22:000s
AREC21:000s 22:000s
M.RT21:000s 22:000s
```

To check the actual value of the compressor timers of circuit 2 (only for EWAQ130~260).

Safety menu

The "safeties" menu provides useful information for trouble shooting purposes. The following screens contain basic information.

```
_v       UNIT SAFETY
0F0:EMERGENCY STOP
```

To consult information about the unit safety which caused the shutdown.

```
_v   CIRCUIT1 SAFETY
1U1:REV PHASE PROT
```

To consult information about the circuit 1 safety which caused the shutdown.

```
_v   CIRCUIT2 SAFETY
1U1:REV PHASE PROT
```

To consult information about the circuit 2 safety which caused the shutdown (only for EWAQ130~260).

```
_v    NETWORK SAFETY
0U4:PCB COMM.PROBLEM
```

To consult information about the network safety which caused the shutdown.

```
_v  UNIT WARNING
0AE:FLOW HAS STOPPED
```

To consult information about the unit warning which caused the shutdown.

Along with the basic information, more detailed information screens can be consulted while the history menu is active. Press the ↵ key. Screens similar to the following will appear. Additionally the number of safeties that already occurred, can be consulted on the first line of the history screens.

```
_÷  UNIT HISTORY:002
0CA:OUT SENSOR ERR
22h33m00s   23/03/06
  COOL INLSP1:012.0°C
```

To check the time at the moment of the unit shutdown and to check which was the evaporator inlet water temperature setpoint.

```
_÷  UNIT HISTORY:002
   INLET WATER:012.0°C
  OUTLET WATER:007.0°C
       AMBIENT:006.5°C
```

To check which were the evaporator inlet, outlet water and ambient temperature at the moment of shutdown.

```
_÷  UNIT HISTORY:002
 C11 DISCHARGE:010.1°C
 C12 DISCHARGE:010.5°C
```

To check which was the discharge temperature of the circuits of circuit 1 at the moment of shutdown.

```
_÷  UNIT HISTORY:002
 C21 DISCHARGE:010.1°C
 C22 DISCHARGE:010.5°C
```

To check which was the discharge temperature of the circuits of circuit 2 at the moment of shutdown (only for EWAQ130~260).

```
_÷  UNIT HISTORY:002
     C1  REFR:000.0°C
```

To check which was the temperature of the refrigerant of circuit 1 at the moment of shutdown.

```
_÷  UNIT HISTORY:002
     C2  REFR:000.0°C
```

To check which was the temperature of the refrigerant of circuit 2 at the moment of shutdown (only for EWAQ130~260).

```
_÷  UNIT HISTORY:002
HP1:019.0b = 050.0°C
LP1:019.0b = -05.2°C
LOWNOISE:N  FAN1:OFF
```

To check which were the pressures of circuit 1 and the status of the fans at the moment of shutdown.

```
_÷  UNIT HISTORY:002
HP2:0190b = 050.0℃
LP2:0190b = -05.2℃
          FAN2:OFF
```

To check which were the pressures of of circuit 2 and the status of the fans at the moment of shutdown (only for EWAQ130~260).

```
_÷  UNIT HISTORY:002
C11:OFF  SAFETY ACT.
C12:OFF  SAFETY ACT.
   UNITCAPACITY:000%
```

To check which was the status of the compressors and the unit capacity of circuit 1 at the moment of shutdown.

```
_÷  UNIT HISTORY:002
C21:OFF  SAFETY ACT.
C22:OFF  SAFETY ACT.
```

To check which was the status of the compressors and the unit capacity of circuit 2 at the moment of shutdown (only for EWAQ130~260).

```
_÷ UNIT HISTORY:002
 CURRENT:055A
 VOLTAGE:023V
```

To check which was the current (Ampere) and voltage of the unit at the moment of shutdown.

```
_÷  UNIT HISTORY:002
C11RH:00000hCS:00000

RHP1:00000hP2:00000h
```

To check which were the total amount of running hours of the compressor and number of compressor stops of circuit 1 and of the pumps at the moment of shutdown (first screen).

```
_÷  UNIT HISTORY:002
C12RH:00000hCS:00000
```

To check which were the total amount of running hours of the compressor and number of compressor stops of circuit 1 at the moment of shutdown (second screen).

```
_÷  UNIT HISTORY:002
C21RH:00000hCS:00000
```

To check which were the total amount of running hours of the compressor and number of compressor stops of circuit 2 at the moment of shutdown (first screen) (only for EWAQ130~260).

```
_÷  UNIT HISTORY:002
C22RH:00000hCS:00000
```

To check which were the total amount of running hours of the compressor and number of compressor stops of circuit 2 at the moment of shutdown (second screen) (only for EWAQ130~260).

```
_÷  UNIT HISTORY:002
AI1 NONE
AI2 NONE
```

To check the changeable analogue input status at the moment of shutdown (first screen).

```
_÷  UNIT HISTORY:002
AI3 NONE
AI4 NONE
```

To check the changeable analogue input status at the moment of shutdown (second screen).

History menu

The "history" menu contains all the information concerning the latest shutdowns. The structure of those menus is identical to the structure of the safeties menu. Whenever a failure is solved and the operator performs a reset, the concerning data from the safeties menu is copied into the history menu.

Additionally, the number of safeties that has already occurred, can be consulted on the first line of the history screens.

Info menu

```
_v          TIME INFO
TIME: 22h05
DATE: WED 24/01/07
```

To consult time and date information.

```
_÷          UNIT INFO
UNIT:AW-CO-260 C:SCL
CIR:2 EVAP:1 COILC:2
EEV:P REF:R410A
```

To consult additional information about the unit such as the unit type, number of circuits and evaporators and the refrigerant used.

```
_÷          UNIT INFO
FAN:ST  VA:Y 2PUMP:Y
HEATERTAPE:Y
FAN DO ST:2 DO INV:2
```

To consult additional information about the unit such as the fan type, Volt Ampere option, if there is a second pump or heater tape present and the quantity of digital outputs that can possibly be used in case of non-inverter fans (ST) or inverter fans (INV).

```
_^          SW INFO
MAIN:SP1710_055 V2.0
EXT :SP1559_017
REM.:SP1734_011
```

To consult information about the controller's software version.

Input/output status menu

The "input/output status" menu gives the status of all the digital inputs and outputs and the changeable digital inputs of the unit.

```
_v    DIGITAL INPUTS
EMERGENCY STOP :OK
FLOWSWITCH:FLOW OK
```

To check whether or not the emergency stop device is active and if there is any water flow to the evaporator.

```
_÷   DIG.INP/OUTPUTS
  HEATER TAPE:OFF
PUMPINTERLOCK:CLOSED
        PUMP:ON
```

To check the status of the heater tape and the state of the pump interlock and pump.

```
_÷    DIGITAL INPUTS
C1 REV.PH.PROT. :OK
C1 HIGH PR.SW.  :OK
INT.L C11:OK C12:OK
```

To check the status of the high pressure switch, the reverse phase protector and the overcurrent relay of circuit 1.

```
_÷    DIGITAL INPUTS
C1 FAN OVERC.ST1:OK
C1 FAN OVERC.ST2:OK
C1 FAN OVERC.ST3:OK
```

To check the fan overcurrent status of circuit 1.

```
_÷    DIGITAL INPUTS
C2 REV.PH.PROT. :OK
C2 HIGH PR.SW.  :OK
INT.L C21:OK C22:OK
```

To check the status of the high pressure switch, the reverse phase protector and the overcurrent relay of circuit 2 (only for EWAQ130~260).

```
_÷    DIGITAL INPUTS
C2 FAN OVERC.ST1:OK
C2 FAN OVERC.ST2:OK
C2 FAN OVERC.ST3:OK
```

To check the fan overcurrent status of circuit 2 (only for EWAQ130~260).

```
_÷    DIGITAL INPUTS
C11:ON C12:ON
C21:ON C22:ON
```

To check the status of the compressors 11/12/21/22.

```
_÷   FAN INP/OUTPUTS
C1 FANSTEP 1:CLOSED
C1 FANSTEP 2:CLOSED
C1 FANSTEP 3:CLOSED
```

To check the status of the fanspeed relays of circuit 1.

```
_÷   FAN INP/OUTPUTS
C2 FANSTEP 1:CLOSED
C2 FANSTEP 2:CLOSED
C2 FANSTEP 3:CLOSED
```

To check the status of the fanspeed relays of circuit 2 (only for EWAQ130~260).

```
_÷CHANG. DIG. INPUTS
DI1 NONE
DI2 NONE
DI3 NONE
```

To check the status of the changeable digital inputs. (first screen)
Note that for a unit in a DICN system, the inputs apply to this unit.
It will be the remote input on the master unit however, that will be determining for the operation of the unit.

_÷CHANG. DIG. INPUTS DI4 NONE DO1 SAFETY+W.(NO) :O DO2 GEN.OPERATION :O	To check the status of the changeable digital inputs and outputs (second screen).
_÷CHANG. INP/OUTPUTS DO3 NONE (OPEN) DO4 NONE (OPEN) DO5 NONE (OPEN)	To check the status of the changeable digital outputs (third screen).
_÷CHANG. INP/OUTPUTS DO6 NONE (OPEN) AI1 NONE AI2 NONE	To check the status of the changeable digital outputs and analogue inputs (fourth screen).
_÷CHANG. INP/OUTPUTS AI3 NONE AI4 NONE AO1 NONE	To check the status of the changeable analogue inputs and outputs (fifth screen)
_^ COMMUNICATION RS232 ONLINE:N RS485 ONLINE:N DIII ONLINE:N	To overview which communication lines are active.

User password menu

ENTER PASSWORD PASSWORD: 0000 TO LOGIN	To change the user password.
_v LOGIN/LOGOUT MENU LOGIN STATUS:USER LOGOUT? NO	To define the user login and logout status.
_^ LOGIN/LOGOUT MENU CHANGE PASSWORD NEW PASSWORD: 0000 CONFIRM: 0000	To change the login/logout password.

Network menu

The "network" menu (only available in case DICN is installed) provides useful information regarding the network.

_v NETWORK COOL. INLSP1:012.0°C INLET WATER:013.6°C OUTLET WATER:007.0°C	To consult the temperature setpoint, the common entering water temperature (entering water temperature of the master unit).
_^M:NORMAL CAP:000% SL1:NORMAL CAP:000% SL2:NORMAL CAP:000% SL3:NORMAL CAP:000%	The status screen of the network menu shows the condition of the master unit (**M**) and slave units (**SL1** ... **SL3**).

Cool/heat menu

This menu is not available for EWAQ units.

Tasks of the usersettings menu

Entering the usersettings menu

The usersettings menu is protected by the user password, a 4-digit number between **0000** and **9999**.

1 Enter the ⊡ **USERSETTINGS MENU**. (Refer to the chapter "How to enter a menu" on page 8).
The controller will request the password.

2 Enter the correct password using the ▲ and ▼ keys and press ↵ for each digit.

3 Press ↵ on the last digit to confirm the password and to enter the usersettings menu.
The controller automatically shows the submenu screen.

To define settings of a certain function:

1 Go to the appropriate submenu of the usersettings menu using the ▲ and ▼ keys.

2 Press the ↵ key to enter the submenu of your choice.

3 Go to the appropriate screen using the ▲ and ▼ keys. If there is only one screen, the ▲ and ▼ keys have no effect.

4 Press the ↵ key to move the cursor to the first parameter which can now be modified.

5 Select the appropriate setting using the ▲ and ▼ keys.

6 Press ↵ to confirm the selection.
When the selection has been confirmed, the cursor switches to the next parameter which can now be modified.

7 Repeat instruction 6 to modify the other parameters.

8 After the last parameter the cursor is switched back to the starting position and continue from instruction 3 onwards.

9 Press the ⎋ key to return to the usersettings menu and continue from instruction 1 onwards.

Submenu: Thermostat

Defining the thermostat settings

When inlet or outlet control mode is selected, the unit uses a thermostat function to control the cooling capacity. However, the thermostat parameters are not fixed and can be modified.

The default, limit and step values for the thermostat parameters are shown in "Annex I" on page 25.

NOTE

- If changed on one of the units in a DICN configuration, this setting is transferred to all other units in the network.
- A functional diagram showing the thermostat parameters can be found in "Annex I" on page 25.

Defining and activating the control mode

The unit is equipped with a thermostat which controls the cooling capacity of the unit. Select the appropriate mode:

- **MANUAL CONTROL**:manual control mode: the operator controls the capacity himself by setting:
  - **C11/12/21/22** (capacity step in manual mode): OFF or ON of compressors 11/12/21/22.
  - **F1***, **F2*** (air flow in manual mode): off, low, medium or high of circuit 1/2.
- **INL WATER**: inlet control mode: uses the entering water temperature to control the capacity of the unit.
- **OUTL WATER**: outlet control mode: uses the leaving water temperature to control the capacity of the unit.

NOTE To activate manual control mode, select MANUAL CONTROL as present mode. To deactivate the manual control mode, select an other mode as present mode.

For units in a DICN configuration:

When changing the control mode on one of the units, it is automatically transferred to all other units.

Manual control mode however can only be selected on units with status DISCONNECT ON/OFF.

NOTE The OUTLET mode is not available for DICN systems.

Submenu: Compressor

Defining the lead-lag settings

In the COMPR.LEAD-LAG screen select the appropriate mode and define the compressor lead-lag settings.

- MODE
  - AUTO: the priority is depending on the running hours of the separate compressors.
  - PRIORITY: C11>C12>C21>C22 the setting in this example C11 has the highest priority to startup while C22 has the lowest priority.

Defining the capacity limitation settings

In the COMPR.CAP.LIMIT screen up to 4 possible capacity limitation settings can be configured.

A capacity limitation can be activated:

- MODE:
  - NOT ACTIVE: the capacity limitation is not active.
  - CHANG.DIG.INP.: when a changeable input is configured as capacity limitation.

    NOTE Refer to "Customization in the service menu", chapter "Setting of the changeable digital inputs and outputs" in the installation manual.
  - LIMIT 25%/50%/75%/SET: to activate capacity limitation.
- in case of CHANG.DIG.INP. or LIMIT SET mode, each compressor must be defined (C11/12/21/ 22).
  - OFF: These compressors will always be switched off
  - ON: These compressors will still be used by the thermostat according to the required load.

Submenu: Fan

Defining the fan low noise settings

The FAN LOW NOISE screen is only available when the option inverter fans is installed (OPIF). Refer to the manual delivered with the option.

Fan forced on settings

Allow to run the fans even when the unit is switched off.

- OFF: the fans will not be activated.
- ON: the fans will be forced to run.
- CH.DIG.INP.: the fans will run, depending on the settings of the changeable digital input.

Submenu: Pump

Defining the pump control settings

The PUMPCONTROL screen of the usersettings menu allows the user to define the pump-leadtime and pump-lagtime.

- PUMPLEADTIME: used to define the time that the pump must run before the unit (or the compressor in case PUMP ON IF: COMPR ON is selected in a DICN configuration) can start up.
- PUMPLAGTIME: used to define the time that the pump keeps running after the unit (or the compressor in case PUMP ON IF: COMPR ON is selected in a DICN configuration) has been stopped.
- DAILY ON: select either Y (yes) or N (no). When Y is selected, define the starting time (24 hour time scale).
  This means that during that time, the pump will run for about 5 seconds, even when the unit is switched off.

Defining dual pump control

The DUAL PUMP screen of the usersettings menu allows the user to define the steering of two pumps (for this to be possible a changeable digital output has to be configured for a second pump in the service menu). Refer to the installation manual.

- MODE: used to define which kind of control will be used for the two pumps. When automatic rotation is chosen the offset on running hours also has to be entered.
  - AUTO ROTATION: pump 1 and pump 2 will alternate to the offset on RH.
  - PUMP 1>PUMP 2: pump 1 will always start up first.
  - PUMP 2>PUMP 1: pump 2 will always start up first.
- OFFSET ON RH: used to define the offset in running hours between the two pumps. Used to switch over between pumps when they work in automatic rotation mode.

Submenu: Floating setpoint

Defining the floating setpoint settings

Setpoint signal is renamed as "floating setpoint based on changeable analogue input".

The FLOATING SETPOINT screen of the usersettings menu allows the active setpoint to be modified in function of the ambient temperature. The source and settings of the floating setpoint can be configured by the user.

- MODE: used to define the mode of the floating setpoint.
  - NOT ACTIVE: floating setpoint is not activated.
  - AMBIENT: floating setpoint is based on the ambient temperature and altered accordingly.
    Settings: MAXPOS, NEG, RF or SLOPE.
  - CH. AI SLOPE NTC: floating setpoint is based on the changeable analogue input (NTC type) and altered accordingly.
    Settings: MAXPOS, NEG, RF or SLOPE.
  - CH. AI SLOPE V-A: floating setpoint is based on the changeable analogue input (V-A type) and altered accordingly.
    Settings: MAXPOS, NEG, RF or SLOPE.
  - CH.AI MAX VALUE: floating setpoint is based on the changeable analogue input (V-A type) and altered accordingly.
    Setting: MAXIMUM VALUE.

NOTE A functional diagram showing the floating setpoint working can be found in "Annex II" on page 26.

Submenu: Language

Defining the language

This screen allows the user to define the language of the displayed information of the controller (on the first screen). (Push the ↵ button repeatedly to change the operating language).

Submenu: Time and date

Defining the time and date

The TIME AND DATE screen of the usersettings menu allows the user to define the time and date.

- TIME: used to define the present time.
- DATE FORMAT: used to define the format of the date.
- DATE: select the name of the present day and define the present date according to the setting of the DATE FORMAT.
  DD = number of day (01~31),
  MM = number of month (01~12)
  YY = the last 2 numbers of the year (2006 = 06).

Submenu: Free cooling

Defining free cooling

The FREE COOLING screen of the usersettings menu allows the user to control a 3-way water valve when the unit is in free cooling state. To make this possible a changeable digital input or output has to be configured for free cooling in the service menu. (Refer to the installation manual.)

- MODE: used to define the free cooling mode.
  - NOT ACTIVE: free cooling is not active.
  - CHDI: changeable digital input will activate the free cooling mode
  - AMBIENT: free cooling is based on ambient temperature.
  - INLET-AMBIENT: free cooling is based on the difference between inlet water temperature and ambient temperature.
- SP: setting of the free cooling setpoint.
- DIF: setting of the free cooling difference.
- PUMP
  - ON: pump will be on when free cooling mode is active
  - OFF: pump will be off when free cooling mode is active
- LEAD: time that the pump will be running before the compressor will start operating.

NOTE A functional diagram showing the free cooling working can be found in "Annex III" on page 26.

Submenu: DICN

Only available in case DICN (option kit EKACPG) is installed (refer to "Connection and setup of a DICN system" in the installation manual and the installation manual of the EKACPG kit).

Defining the network settings

The SETTINGS screen of the network menu allows the user to set the MODE of the unit, the OFFSET time and the condition when the pump must operate.

- MODE: Define the mode of the unit as NORMAL, STANDBY or DISCONN ON/OFF.
  - NORMAL: The unit is controlled by the network. Loading and unloading is decided by the central control of the netwerk. Putting this unit ON or OFF will also put all other units ON or OFF, unless their status is DISCONNECT ON/OFF. (see further)
    Changing CONTROL SETTINGS or THERMOSTAT SETTINGS to this unit, will apply to all other units. MANUAL CONTROL on such a unit is not possible. Refer to "Defining and activating the control mode" on page 14.
  - STANDBY: The unit is considered as a NORMAL unit and its function is then also similar to a unit defined as NORMAL, but this unit however, will only come into operation if:
    another unit is in alarm
    another unit is in DISCONNECT ON/OFF mode
    the setpoint is not reached when all other units have been running on full capacity for some time
    If more than one unit is defined as STANDBY, only 1 of the units will be really standby. The unit which is really standby will be decided by the number of running hours.
  - DISCONNECT ON/OFF: Putting this unit ON or OFF will not put other units ON or OFF. MANUAL CONTROL on such a unit is possible.
    If the unit is put to INLET or OUTLET mode, and the unit is ON, it will be controlled by the DICN network as a NORMAL unit.

NOTE Put a unit to DISCONNECT ON/OFF when servicing the machine. In this case it is possible to switch ON or OFF this unit without switching ON or OFF the other units of the network.

It is also possible then to operate the unit in MANUAL CONTROL.

Put a unit to DISCONNECT ON/OFF continuously if the operator wants to decide by himself when this unit must operate.

Note that in this case, it makes no sense to define another unit of the network as STANDBY. Since there is a unit set continuously to DISCONNECT ON/OFF, the STANDBY unit will continuously be considered as a NORMAL unit.

- OFFSET: The OFFSET time defines the target difference in running hours between one unit and another unit with OFFSET:0000h. This value is important for maintenance purposes. The difference in setting among different units should be high enough as to avoid servicing of the units all at the same time. The lower and upper limits are 0 and 9000 hours respectively. The default value is 0 hours.
- PUMP ON IF: Set if the pump must operate as long as the chiller is on (UNIT ON), or during compressor on condition only (COMPR ON).
  When UNIT ON is selected, the pump output will remain closed as long as the chiller is on. When COMPR ON is selected, the pump output will remain closed as long as the compressor is on. Also refer to the separate manual "Installation examples for a DICN configuration".

NOTE The settings on this screen of the network menu must be executed for all chillers connected to the system.

Submenu: Advanced

Activating or deactivating the setpoints password and the unit on/off password

The first ADVANCED screen of the usersettings menu allows the user to activate or deactivate the user password needed to change the temperature setpoint (SETPOINT MENU). When deactivated, the user does not have to enter the password each time he wants to change the setpoint.

The first ADVANCED screen of the usersettings menu also allows the user to activate or deactivate the user password needed to switch the unit ON or OFF (UNIT ON/OFF).

NOTE If changed on one of the units in a DICN configuration, this setting is automatically transferred to all the other units in the network.

Defining controller settings

The second **ADVANCED** screen of the usersettings menu also allows the user to define settings for the controller.

- **MAIN MENU**: set to **GRAPHIC** to let the main menu show the graphical symbols or to **TEXT** to let the main menu show the names of the menus.
- **LOGOUT TIMER**: set the time for automatic log out, between 01 and 30 minutes.
- **BUZZER IF SAFETY**: to activate or deactivate the buzzer sound when an error should occur.
- **BACKLIGHT TIME**: to define the time (between 01 and 30 minutes) the light of the controller display will stay on after the last manipulation of the controller buttons.
- **GRAPHIC READOUT**: to define if the graphical representation of the first screen of the read out menu is present or not.

NOTE If changed on one of the units in a DICN configuration, this setting is automatically transferred to all the other units in the network.

Submenu: Defrost

This submenu is not available for EWAQ units.

Submenu: Service menu

Only a qualified installer is allowed to enter the service menu.

Tasks of the timers menu

Checking the actual value of the software timers

As a protective measure and to ensure correct operation, the controller's software features several countdown timers:

- LOADUP (**LOADUP** – refer to the thermostat parameters): starts counting when a thermostat step change has occurred. During the countdown, the unit is not able to enter a higher thermostat step.
- LOADDOWN (**DWN** – refer to the thermostat parameters): starts counting when a thermostat step change has occurred. During the countdown, the unit will not be able to go to a lower thermostat step.
- FLOWSTART (**FLOWSTART** – 15 sec): counts down when the water flow through the evaporator is continuous and the unit is in standby. During the countdown, the unit cannot start up.
- FLOWSTOP (**FLOWSTOP** – 5 sec): starts counting when the water flow through the evaporator stops after the flowstart timer has reached zero. If the water flow has not restarted during the countdown, the unit will shut down.
- PUMPLEAD (**PUMPLEAD** – refer to the pump control settings): starts counting whenever the unit is switched on. During the countdown, the unit cannot start up.
- PUMPLAG (**PUMPLAG** – refer to the pump control settings): starts counting whenever the unit is switched off. During the countdown, the pump keeps running.
- GUARDTIMER (**GRD11/12/21/22** – 180 sec): starts counting when the compressor (circuit 1/2) has been shut down. During the countdown, the compressor cannot be restarted.
- ANTIRECYCLING (**AREC11/12/21/22** – 300 sec): starts counting when the compressor (circuit 1/2) has started. During the countdown, the compressor cannot be restarted.
- MINIMUM RUNNING TIME (**M.RT** - 120 sec) starts counting when the compressor has started. During the count down, the compressor will not be switched off by the thermostat function.

To check the actual value of the software timers, proceed as follows:

1 Enter the **TIMERS MENU**. (Refer to the chapter "How to enter a menu" on page 8.)

The controller displays the actual value of the **GENERAL TIMERS**: the loadup timer, the loaddown timer, the flowstart timer, the flowstop timer (when the unit is on and the flowstart timer has reached zero), the pumplead timer and the pumplag timer.

2 Press the ▼ key to check the compressor timers.

The controller shows the actual value of the **COMPRESSOR TIMERS**: the guard timers (one per circuit) and the antirecycling timers (one per circuit).

Tasks of the safety menu

Listing activated safeties and checking the unit status

If the alarm buzzer is activated and the user presses the 🔔 key, the controller automatically enters the safeties menu.

All active safeties are displayed: **UNIT/CIRCUIT 1/2**, **WARNING** or **NETWORK SAFETY**.

- The controller will show the **UNIT SAFETY** screen of the safeties menu when a unit safety was the cause of shutdown.
- The controller will show the **CIRCUIT 1/2 SAFETY** screen of the safeties menu when a safety of the circuit 1/2 was activated.
- The controller will show the **NETWORK SAFETY** screen of the safeties menu when a safety of the network was activated.
- The controller will show the **UNIT WARNING** screen of the safeties menu when a unit warning was activated.

1 Press the 🔔 key when the alarm buzzer is activated.

The appropriate safety screen with the basic information appears. Press the ↵ key to go directly to the history menu and see the detailed information. These screens provide information about the unit status at the moment of shutdown (see "Safety menu 🔔" on page 12).

2 If more than one kind of safety is active (indicated by means of ^, v or ÷), use the ▲ and ▼ keys to consult them.

Tasks of the history menu

Checking the safety info and the unit status after a reset

The information available in the safeties menu is also stored in the history menu, where it is stored after resetting the unit or the circuit. In this way, the history menu provides a means of checking the unit status at the moment of the latest shutdown.

To check the safety info and the unit status, proceed as follows:

1 Enter the **HISTORY MENU**. (Refer to the chapter "How to enter a menu" on page 8.)

The controller enters the last **HISTORY** screen which contains basic information of the moment of this shutdown.

2 Press the ▲ and ▼ keys to consult the other present **HISTORY** screens.

3 Press the ↵ key to see the detailed information.

Tasks of the info menu

Consulting additional unit information

1 Enter the INFO MENU through the main menu. (Refer to the chapter "How to enter a menu" on page 8).
The controller enters the TIME INFO screen which contains the following information: the TIME and DATE.

2 Press ▼ to consult the first UNIT INFO screen.
This screen contains information about the unit name, number of circuits, evaporators and coils, EEV and the refrigerant used.

3 Press ▼ to consult the second UNIT INFO screen.
This screen contains information about the fans, volt/ampere and if there is a second pump or heater tape applied.

4 Press ▼ to consult the SW INFO (software information) screen.
This screen contains information about the PCB software versions.

Tasks of the input/output menu

Checking the status of the inputs and outputs

The input/output menu provides a means of checking the status of the digital inputs and the status of the relay outputs.

The locked digital inputs are:

- EMERGENCY STOP: whether the emergency button has been pressed (only effective if there is an emergency stop present).
- FLOWSWITCH: indicates the status of the flowswitch (flow/no flow).
- HEATER TAPE: indicates if the heater tape is activated or not.
- PUMPINTERLOCK: indicates if the status of the pump interlock is open or closed.
- PUMP: indicates if the pump is on or off.
- C1/2 REV.PH.PROT.: (reverse phase protector) indicates the actual status of this safety of circuit 1/2.
- C1/2 HIGH PR.SW.: (high pressure switch) indicates the actual status of this safety of circuit 1/2.
- INT.L C11/C12/C21/22: (interlock to compressor) indicates the actual status of this safety of circuit1/2.
- C1/2 FANOVERC. ST. 1/2/3: (fan overcurrent status step 1/2/3) indicates the actual status of this safety of circuit 1/2.

The locked relay outputs are:

- C11/12/21/22: indicates whether the circuit 1/2 is on or off.
- C1/2 FANSTEP 1/2/3: indicates if the fans of fanstep 1/2/3 for the circuit 1/2 are on or not.

Checking the status of the digital changeable inputs and outputs

The possible settings for the changeable digital inputs are:

- NONE: indicates there is no function selected for this input
- STATUS: indicates the position of the connected switch.
- DUAL SETPOINT: indicates the position of the remote dual setpoint switch: setpoint 1 or setpoint 2.
- REMOTE ON/OFF: indicates the position of the remote on/off switch.
- CAP LIMIT 25%/50%/75%/SET: indicates the position of the "enable/disable capacity limitation" switches.
- LOW NOISE: indicates the status of the low noise mode.
- FREE COOLING REQ: indicates if the free cooling is requested or not requested.
- FAN FORCED ON: indicates if the fan forced on is activated or not activated.

The possible settings for the changeable relay outputs are:

- NONE (OPEN): Digital output open.
- CLOSED: Digital output closed.
- 2ND PUMP: indicates the status of the second pump.
- 100% CAPACITY: indicates when the unit is working at 100%.
- FULL CAPACITY: indicates when the unit is working at maximum capacity, example reached 100% capacity or reached maximum capacity because of safety limitation.
- FREE COOLING: indicates the status of the 3-way water valve when the unit is in free cooling state.
- GEN.OPERATION: indicates when the unit is active.
- SAFETY+W (NO): indicates when safety or warning is active (Normal Open contact).
- SAFETY+W (NC): indicates when safety or warning is active (Normal Closed contact).
- SAFETY (NO): indicates when safety is active (Normal Open contact).
- SAFETY (NC): indicates when safety is active (Normal Closed contact).
- C1/2 SAFETY: indicates when circuit 1/2 safety is active.
- WARNING: indicates when warning is active.
- C1/2 OPERATION: indicates when circuit 1/2 operation is active.

Checking the status of the analogue changeable inputs and output

The possible settings for the analogue changeable inputs and output are:

- NONE: no function is appointed to the changeable analogue input.
- STATUS: only displays the status by means of test
- FLOATING SETP: floating setpoint based on ambient or analogue input
- TEMPERATURE: only displays the (by example) condenser outlet temperature
- DI***: refer to the possible functions for changeable digital inputs. (*** can be any of the following: STATUS, DUAL SETPOINT, REMOTE ON/OFF, CAP. LIMIT, LOW NOISE, FREE COOLING REQ or FAN FORCED ON.)

Checking the communication inputs and outputs (option EKACPG)

The communication inputs and outputs are:

- RS232 ONLINE: indicates if the RS232 communication line is active.
- RS485 ONLINE: indicates if the RS485 communication line is active.
- DIII ONLINE: indicates if the DIII communication line is active.

To check the inputs and outputs, proceed as follows:

1 Enter the I/O STATUS MENU. (Refer to the chapter "How to enter a menu" on page 8.)
The controller enters the first DIGITAL INPUTS screen.

2 Consult the other screens of the input/output menu using the ▲ and ▼ keys.

Changing the user password

Access to the usersettings menu and the setpoints menu is protected by the user password (a 4-digit number between 0000 and 9999).

After the password is entered, other protected screens do no longer require the entering of the password.

To log out, go to the login/logout menu and alter the login status and the logout setting.

NOTE The default user password is 1234.

To change the user password, proceed as follows:

1 Enter the USERPASSWORD MENU. (Refer to the chapter "How to enter a menu" on page 8).
The controller will request the password.

2 Enter the actual correct password using the ▲, ▼ and ↵ keys.
For each of the 4 digits:
- Use the ▲ and ▼ keys to select the correct number.
- Press the ↵ key to enter and select the next number.
When pressing the ↵ key on the last number, the complete password is entered.

3 After the ↵ key has been pressed to confirm the password, the controller shows the first login/logout screen.
The login status is shown.
The logout is set to NO.

4 When the setting for logout must change to YES.
- Press the ↵ key to position the cursor behind LOGOUT?
- Press the ▲ or ▼ keys to change the setting to YES.
- Press the ↵ key to confirm the setting.
The controller leaves the login/logout screen and shows the first screen of the read out menu.

5 When the setting for logout stays NO, press the ▼ key to enter the second login/logout screen.
The controller requests for a new password.

6 Press the ↵ key to position the cursor behind NEW PASSWORD.

7 Enter the new password using the ▲, ▼ and ↵ keys.
For each of the 4 digits:
- Use the ▲ and ▼ keys to select the correct number.
- Press the ↵ key to enter and select the next number.
When pressing the ↵ key on the last number, the complete new password is entered and the cursor is positioned behind CONFIRM.
The controller requests to confirm the new password.

8 Enter the new password again using the ▲, ▼ and ↵ keys.
For each of the 4 digits:
- Use the ▲ and ▼ keys to select the correct number.
- Press the ↵ key to enter and select the next number.
When pressing the ↵ key on the last number, the confirmation of the new password is completed.

NOTE The actual password will only be changed when the new password and the confirmed password have the same value.

If changed on one of the units in a DICN configuration, this setting is automatically transferred to all the other units in the network.

TROUBLESHOOTING

This section provides useful information for diagnosing and correcting certain troubles which may occur in the unit.

Before starting the trouble shooting procedure, carry out a thorough visual inspection of the unit and look for obvious defects such as loose connections or defective wiring.

Before contacting your local dealer, read this chapter carefully, it will save you time and money.

⚠ When carrying out an inspection on the supply panel or on the switch box of the unit, always make sure that the circuit breaker of the unit is switched off.

Overview of safety messages

Message safety menu		Symptom
UNIT SAFETY	0AE:FLOW HAS STOPPED	5.2
	0AE:PUMPINTERLOCK	5.3
	0A4:FREEZE UP C1	5.1
	0A4:FREEZE UP C2	5.1
	0A9:EEV PCB COMM ERR	5.5
	0A9:EEV PCB ERR	5.5
	0C9:INL SENSOR ERR	7
	0CA:OUT SENSOR ERR	7
	0H9:AMB T SENSOR ERR	7
	0U4:EXTPCB COMM.ERR	9
	0U4:MAINPCB COMM.ERR	10
	0U5:PCB COMM.PROBLEM	11
CIRCUIT 1 SAFETY	153:FAN OVERC. ST1	5.4
	153:FAN OVERC. ST2	5.4
	153:FAN OVERC. ST3	5.4
	1A9:EEV ERR	5.5
	1A9:SUPERHEAT ERR	5.6
	1E3:HIGH PRESSURE SW	5.7
	1E4:LOW PRESSURE	5.8
	1E6:COMPR 1 SAFETY	5.9b/5.10
	1E6:COMPR 2 SAFETY	5.9b/5.10
	1F3:HIGH DISCH TEMP1	5.11
	1F3:HIGH DISCH TEMP2	5.11
	1J3:DISCHSENSOR ERR1	7
	1J3:DISCHSENSOR ERR2	7
	1J5:REFR SENSOR ERR	7
	1J5:SUCTSENSOR ERR	7
	1JA:HP SENSOR ERR	7
	1JC:LP SENSOR ERR	7
	1U1:REV PHASE PROT	5.12
CIRCUIT 2 SAFETY	253:FAN OVERC. ST1	5.4
	253:FAN OVERC. ST2	5.4
	253:FAN OVERC. ST3	5.4
	2A9:EEV ERR	5.5
	2A9:SUPERHEAT ERR	5.6
	2E3:HIGH PRESSURE SW	5.7
	2E4:LOW PRESSURE	5.8
	2E6:COMPR 1 SAFETY	5.9b/5.10
	2E6:COMPR 2 SAFETY	5.9b/5.10
	2F3:HIGH DISCH TEMP1	5.11
	2F3:HIGH DISCH TEMP2	5.11
	2J3:DISCHSENSOR ERR1	7
	2J3:DISCHSENSOR ERR2	7
	2J5:REFR SENSOR ERR	7
	2J5:SUCTSENSOR ERR	7
	2JA:HP SENSOR ERR	7
	2JC:LP SENSOR ERR	7
	2U1:REV PHASE PROT	5.12

Message safety menu		Symptom
UNIT WARNING	0AE:FLOW HAS STOPPED	5.2
	0C9:INL SENSOR ERR	7
	1E3:HP SETBACK	5.7
	153:FAN OVERC. ST1	5.4
	153:FAN OVERC. ST2	5.4
	153:FAN OVERC. ST3	5.4
	2E3:HP SETBACK	5.7
	253:FAN OVERC. ST1	5.4
	253:FAN OVERC. ST2	5.4
	253:FAN OVERC. ST3	5.4
NETWORK SAFETY	0C9:INL SENSOR ERR	7
	0U4:PCB COMM.PROBLEM	12
	0U4:SW VERSION ERR	13

When a safety device was activated, stop the unit and find out why the safety device was activated before resetting it. Under no circumstances safety devices may be bridged or changed to a value other than the factory setting. If the cause of the problem cannot be found, call your local dealer.

Symptom 1: The unit does not start, but the ON LED lights up

POSSIBLE CAUSES	CORRECTIVE ACTION
The temperature setting is not correct.	Check the controller setpoint.
The flowstart timer is still running.	The unit will start after approx. 15 seconds. Make sure that water is flowing through the evaporator.
The circuit can not start up.	Refer to Symptom 4: The circuit does not start up.
Unit is in manual mode (all compressors at 0%).	Check on the controller.
Power supply failure.	Check the voltage on the supply panel.
Blown fuse or interrupted protection device.	Inspect fuses and protection devices. Replace by fuses of the same size and type (refer to "Electrical specifications" on page 2).
Loose connections.	Inspect connections of the field wiring and the internal wiring of the unit. Tighten all loose connections.
Shorted or broken wires.	Test circuits using a tester and repair if necessary.

Symptom 2: The unit does not start, but the ON LED is flashing

POSSIBLE CAUSES	CORRECTIVE ACTION
The remote ON/OFF input is enabled and the remote switch is off.	Put the remote switch on or disable the remote ON/OFF input.

Symptom 3: The unit does not start and the ON LED does not light up

POSSIBLE CAUSES	CORRECTIVE ACTION
The unit is in failure mode.	Refer to Symptom 5: Safety devices are activated and alarm messages are displayed.
One of the following safety devices is activated: • Flowswitch (S8L,S9L) • Emergency stop	Refer to Symptom 5: Safety devices are activated and alarm messages are displayed.
The ON LED is broken.	Contact your local dealer.

Symptom 4: The circuit does not start up

POSSIBLE CAUSES	CORRECTIVE ACTION
One of the following safety devices is activated: • Compressor thermal protector (Q*M) • Overcurrent relay (K*S) • Discharge thermal protector • Low pressure • High pressure switch (S*PH) • Reverse phase protector • Freeze-up	Check on the controller and refer to Symptom 5: Safety devices are activated and alarm messages are displayed.
The anti-recycling timer is still active.	The circuit can only start up after approximately 5 minutes.
The guard timer is still active.	The circuit can only start up after approximately 3 minutes.
The circuit is limited to 0%.	Check the enable/disable capacity limitation remote contact.

Symptom 5: Safety devices are activated and alarm messages are displayed

Symptom 5.1: Freeze-up protection is activated (0A4:FREEZE UP)	
POSSIBLE CAUSES	CORRECTIVE ACTION
Water flow too low.	Increase the water flow.
Inlet temperature to the evaporator is too low.	Increase the inlet water temperature.
Flow switch is not working or no water flow.	Check the flow switch and the water pump.
RESET	*After temperature increase the freeze-up is reset automatically, but the circuit controller needs to be reset.*
Symptom 5.2: Flowswitch is activated (0AE:FLOW HAS STOPPED)	
POSSIBLE CAUSES	CORRECTIVE ACTION
No water flow or too low water flow.	Check the water pump filter and the water circuit for obstructions.
RESET	*After finding the cause, the flowswitch is reset automatically, but the controller still needs to be reset.*
Symptom 5.3: Pump interlock contact is open (0AE:PUMPINTERLOCK)	
POSSIBLE CAUSES	CORRECTIVE ACTION
The pump interlock contact is not closed.	Make sure a pump interlock contact is wired correctly and closed when the pump starts operating.
RESET	***Only if a pump contactor is present**: Switch the black handle on the pump fuse inside the switchbox and reset the controller.*
Symptom 5.4: Fan overcurrent is activated (153/253:FAN OVERC. 1/2/3)	
POSSIBLE CAUSES	CORRECTIVE ACTION
Mechanical failure (fan is blocked).	Check that the fan rotates freely.
Air flow in the unit too low or outdoor temperature too high.	Clean the air heat exchanger properly.
RESET	*Push the blue button on the fan fuse inside the switchbox and reset the controller.*
Symptom 5.5: EEV driver is not operating (0A9:EEV PCB (COMM) ERR, 1A9/2A9:EEV ERR)	
POSSIBLE CAUSES	CORRECTIVE ACTION
The EEV driver is not operating.	Check the power supply to the EEV driver. Check if the address setting by DIP-switch is according to the wiring diagram.

Symptom 5.6: Superheat temperature is not correct (1A9/2A9:SUPERHEAT ERR)	
POSSIBLE CAUSES	CORRECTIVE ACTION
Superheat temperature is too high.	Check if the unit has enough refrigerant (no foaming visible in sight glass). Check if the suction temperature sensor of the EEV driver is in the holder in the suction tube and not hanging loose.
Superheat temperature is too low.	Check if the EEV driver or the control motor of EEV is wired correctly and operating.
The sensed suction temperature is more than 2°C higher than the entering water temperature of the evaporator.	Check if the suction temperature sensor of the controller is in its holder and not hanging loose.

Symptom 5.7: High-pressure switch and high pressure setback (1E3/2E3:HIGH PRESSURE SW, 1E3/2E3:HP SETBACK)	
POSSIBLE CAUSES	CORRECTIVE ACTION
Condenser fan does not operate properly.	Check that the fans turn freely. Clean if necessary.
Dirty or partially blocked condenser.	Remove any obstacle and clean condenser coil using brush and blower.
Inlet air temperature of the condenser is too high.	The air temperature measured at the inlet of the condenser may not exceed 43°C.
Fan turning in the wrong direction.	Two phases of the power supply to the fan motor must be inverted (by a licensed electrician).
RESET	*After pressure rise, this safety resets automatically, but the controller still needs to be reset.*

Symptom 5.8: Low pressure (1E4/2E4:LOW PRESSURE)	
POSSIBLE CAUSES	CORRECTIVE ACTION
Water flow to water heat exchanger too low.	Increase the water flow.
Shortage of refrigerant.	Check for leaks and refill refrigerant, if necessary.
Unit is working out of its operation range.	Check the operation conditions of the unit.
Inlet temperature to the water heat exchanger is too low.	Increase the inlet water temperature.
Dirty evaporator.	Clean the evaporator, or call your local dealer.
Low pressure safety setting too high.	Refer to the installation manual "Customization in the service menu", paragraph "Setting of the minimum outlet water temperature" for correct values.
Flowswitch is not working or no water flow.	Check the flowswitch and the water pump.
RESET	*After pressure rise, this safety resets automatically, but the controller still needs to be reset.*

Symptom 5.9a: The compressor does not work (only for SJ161-4) (Compressor thermal protection is activated)	
POSSIBLE CAUSES	CORRECTIVE ACTION
The compressor motor coil temperature is too high because the compressor motor takes (demands/needs) too much current and is not sufficiently cooled by refrigerant.	Make sure there are no refrigerant leaks. After repairing leaks, charge the unit with additional refrigerant until the sight glass in the liquid line shows no foaming.
	Make sure the unit operates within its operating range (too high ambient or too high water temperature).
	Make sure the compressor motor is not locked.
RESET	*After temperature decrease the thermal protector is reset automatically and the compressor will start again. This is not detected by the controller.* If the protector is activated frequently, call your local dealer.

Symptom 5.9b: Compressor safety (only for SJ161-4) (1E6/2E6:COMPR 1/2 SAFETY)	
POSSIBLE CAUSES	CORRECTIVE ACTION
Failure of one of the phases.	Check fuses on the supply panel or measure the supply voltage.
Voltage too low.	Measure the supply voltage.
The unit is working out of its range.	Make sure the unit operates within its operating range.
Overload of motor.	Reset. If the failure persists, call your local dealer.
There is a short circuit.	Check the wiring.
RESET	*Pull the black handle on the compressor fuse inside the switch box and reset the controller.*

Symptom 5.10: Compressor safety (only for SJ180-4~SJ240-4 and SJ300-4) (1E6/2E6:COMPR 1/2 SAFETY)	
POSSIBLE CAUSES	CORRECTIVE ACTION
The compressor motor coil temperature is too high because the compressor motor takes (demands/needs) too much current and is not sufficiently cooled by refrigerant.	Make sure there are no refrigerant leaks. After repairing leaks, charge the unit with additional refrigerant until the sight glass in the liquid line shows no foaming.
	Make sure the unit operates within its operating range (too high ambient or too high water temperature).
	Make sure the compressor motor is not locked.
RESET	*After temperature decrease, a 5 minute delay is activated. After this delay the relay in the electronic protection module (EPM) is pulled in. The controller needs to be reset manually.*
Failure of one of the phases.	Check fuses on the supply panel or measure the supply voltage.
Voltage too low.	Measure the supply voltage.
The unit is working out of its range.	Make sure the unit operates within its operating range.
Overload of motor.	Reset. If the failure persists, call your local dealer.
The compressor is running in reverse phase (only for SJ240-SJ300)	Check the wiring.
There is a short circuit.	Check the wiring.
RESET	*Pull the black handle on the compressor fuse inside the switch box and reset the controller.*

Symptom 5.11: Discharge thermal protector is activated (1F3/2F3:HIGH DISCH TEMP1/2)	
POSSIBLE CAUSES	CORRECTIVE ACTION
Unit is working outside the operation range.	Check the operation condition of the unit.
The unit is undercharged.	Check if there are no refrigerant leaks. After repairing leaks, charge the unit with additional refrigerant until the sight glass in the liquid line shows no foaming.
RESET	*After temperature decrease, the safety resets automatically but the controller still needs to be reset.*

Symptom 5.12: Reverse phase protector is activated (1U1/2U1:REV PHASE PROT)	
POSSIBLE CAUSES	CORRECTIVE ACTION
Two phases of the power supply are connected in the wrong phase position.	Invert two phases of the power supply (by licensed electrician).
One phase is not connected properly.	Check the connection of all phases.
Voltage too low.	Measure the supply voltage.
RESET	*After inverting two phases or fixing the power supply cables properly, the protector is reset automatically, but the controller still needs to be reset.*

Symptom 6: Unit stops soon after operation

POSSIBLE CAUSES	CORRECTIVE ACTION
One of the safety devices is activated.	Check safety devices (refer to Symptom 5: Safety devices are activated and alarm messages are displayed).
Voltage is too low.	Test the voltage in the supply panel and, if necessary, in the electrical compartment of the unit (voltage drop due to supply cables is too high).

Symptom 7: Sensor error `0C9/0CA/0H9:*** SENSOR ERR`

POSSIBLE CAUSES	CORRECTIVE ACTION
The sensor is broken or not correctly wired.	Check if the wiring is according to the wiring diagram. Call your local dealer.

Symptom 8: The alarm message shows `0U3:REMOCON SW ERR`

POSSIBLE CAUSES	CORRECTIVE ACTION
The software for the wired remote controller (A4P or A5P) is corrupt or absent.	Check if the wiring to the main PCB (A11P) is according to the wiring diagram. Check if the "address setting" and the "terminator resistor setting" by DIP-switch is according to the setting mentioned in the wiring diagram. Call your local dealer.

Symptom 9: The alarm message shows `0U4:EXT PCB COMM.ERR`

POSSIBLE CAUSES	CORRECTIVE ACTION
The extension PCB (A01P) can not be found.	Check if the wiring to the extension PCB (A01P) is according to the wiring diagram. Call your local dealer.

Symptom 10: The alarm message shows `0U4:MAINPCB COMM.ERR`

POSSIBLE CAUSES	CORRECTIVE ACTION
The main PCB of circuit 2 (A21P) can not be found.	Check if the wiring to the main PCB of circuit 2 (A21P) is according to the wiring diagram. Check if the "address setting" and the "terminator resistor setting" by DIP-switch is according to the setting mentioned in the wiring diagram. Call your local dealer.

Symptom 11: The alarm message shows `0U5:PCB COMM.PROBLEM`

POSSIBLE CAUSES	CORRECTIVE ACTION
The wired remote controller (A4P or A5P (EKRUPG)) has no correct communication with the main PCB (A11P).	Check if the wiring to the main PCB (A11P) is according to the wiring diagram. Check if the "address setting" and the "terminator resistor setting" by DIP-switch is according to the setting mentioned in the wiring diagram. Call your local dealer.

Symptom 12: The `NETWORK SAFETY` **alarm message shows** `0U4:PCB COMM.PROBLEM`

POSSIBLE CAUSES	CORRECTIVE ACTION
The unit can not be found by the DICN system (EKACPG)	Check if the wiring between units is according to the wiring diagram. • Make sure all the units in the DICN system are powered up. • Make sure that the correct number of slave units is defined in the master unit. • Make sure that the correct unit address setting is defined in each unit (refer to the installation manual).

Symptom 13: The `NETWORK SAFETY` **alarm message shows** `0U4:SW VERSION ERR`

POSSIBLE CAUSES	CORRECTIVE ACTION
All units in the DICN system (EKACPG) do not have the same software version.	Check the software version of each unit. Call your local dealer in case a software upgrade is necessary.

Symptom 14: The water pressure can not be maintained

POSSIBLE CAUSES	CORRECTIVE ACTION
There is a leak in the water circuit.	Check for any leaks in the water circuit.
The expansion vessel is broken or does not work properly.	Replace the expansion vessel.

MAINTENANCE

In order to ensure optimal availability of the unit, a number of checks and inspections on the unit and the field wiring have to be carried out at regular intervals.

If the unit is used for air conditioning application, the described checks must be executed at least once a year. In case the unit is used for other applications, the checks must be executed every 4 months.

Before carrying out any maintenance or repair activity, always switch off the circuit breaker on the supply panel, remove the fuses or open the protection devices of the unit.

Never clean the unit with water under pressure.

Maintenance activities

The wiring and power supply must be checked by a licensed electrician.

- Air heat exchanger
  Remove dust and any other contaminant from the coil fins using a brush and a blower. Blow from the inside of the unit. Take care not to bend or damage the fins.
- Field wiring and power supply
  - Check the power supply voltage on the local supply panel. The voltage must correspond to the voltage marked on the identification label of the unit.
  - Check the connections and make sure they are properly fixed.
  - Check the proper operation of the circuit breaker and the earth leak detector provided on the local supply panel.
- Internal wiring of the unit
  Visually check the switch boxes on loose connections (terminals and components). Make sure that the electrical components are not damaged or loose.
- Earth connection
  Make sure that the earth wires are still connected properly and that the earth terminals are tightened.
- Refrigerant circuit
  - Check for leaks inside the unit. In case a leak is detected, call your local dealer.
  - Check the working pressure of the unit. Refer to "Switching the unit on" on page 8.
- Compressor
  - Check on oil leaks. If there is an oil leak, call your local dealer.
  - Check for abnormal noises and vibrations. If the compressor is damaged, call your local dealer.
- Fan motor
  - Clean the cooling ribs of the motor.
  - Check on abnormal noises. If the fan or motor are damaged, call your local dealer.

- Water supply
  - Check if the water connection is still well fixed.
  - Check the water quality (refer to the installation manual of the unit for specifications of the water quality).
- Water filters
  - Make sure to clean the water filter in front of the evaporator water inlet once every 4 months.
  - Check the filter for any possible damage and make sure that the hole diameter size all over the filter surface is still 1.0 mm maximum.
- Water sensors
  Check that all the water sensors are correctly fixed into the inlet and outlet water pipe.
- Flowswitch
  Make sure that there is no dirt accumulating on the paddle of the flowswitch.
- Water pressure
  Check if the water pressure is within acceptable range. Refer to the installation manual delivered with the unit.

Disposal requirements

Dismantling of the unit, treatment of the refrigerant, of oil and of other parts must be done in accordance with relevant local and national legislation.

NOTES

NOTES

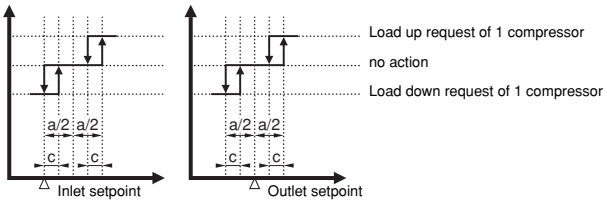
ANNEX I

Thermostat parameters

Water temperature control

The figures below show the thermostat diagram in case of inlet water temperature control.

■ **Stand alone thermostat(1) (inlet or outlet)**



The default value and the upper and lower limits of the thermostat parameters are listed in the table below.

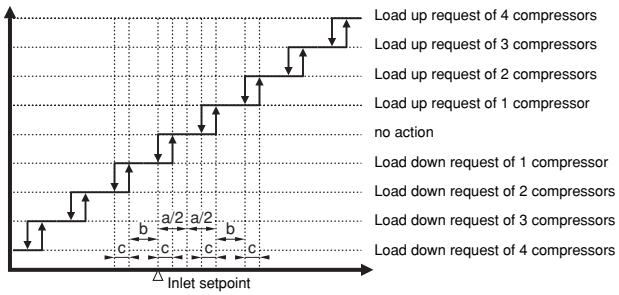
INLET CONTROL		Default value Units 1 circuit	Default value Units 2 circuits	Lower limit	Upper limit
Step difference - a	(K)	4.0(*)	2.0(*)	—	—
Steplength - c	(K)	0.2(*)		—	—
Loadup timer	(sec)	180		15	300
Loaddown timer	(sec)	30		15	300
Setpoint	(°C)	12.0		7.0	23.0

(*) can only be modified in the service menu

OUTLET CONTROL		Default value Units 1 circuit	Default value Units 2 circuits	Lower limit	Upper limit
Step difference - a	(K)	4.0(*)	2.0(*)	—	—
Steplength - c	(K)	0.2(*)		—	—
Loadup timer	(sec)	30		15	300
Loaddown timer	(sec)	15		15	300
Setpoint	(°C)	7.0		4.0	20.0

(*) can only be modified in the service menu

■ **DICN thermostat(1) (inlet)**



The default value and the upper and lower limits of the thermostat parameters are listed in the table below.

INLET CONTROL		Default value	Lower limit	Upper limit
Step difference - a	(K)	4.0(*)	—	—
Step difference - b	(K)	3.6(*)	—	—
Step difference - c	(K)	0.4(*)	—	—
Loadup timer	(sec)	180	15	300
Loaddown timer	(sec)	180	15	300
Setpoint	(°C)	12.0	7.0	23.0

(*) can only be modified in the service menu

■ If the temperature is below the setpoint, the thermostat control will check every LOADDOWN TIMER.
According to the deviation to the setpoint, no action, load up, down is required.

■ If the temperature is above the setpoint, the thermostat control will check every LOADUP TIMER.
According to the deviation to the setpoint, no action, load up, down is required.

(1) Loadup request of 1 compressor: request to add one additional compressor.
Loadup request of 2 compressors: request to add 2 additional compressors (with interval of 15 seconds inbetween).
The maximum number of compressors that can possibly be added in 1 request is limited to the total number of units that are present in the DICN setup:
Example: A DICN setup with 2 units means load up requests of maximum 2 compressors at a time.

ANNEX II

Floating setpoint working

The diagrams and table below show the default value of the floating setpoint parameters on the evaporator and an example on the inlet setpoint of 12.0°C.

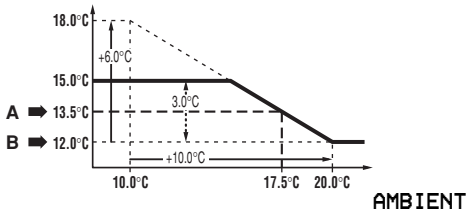
Legend

SLOPE	The rise in floating setpoint value for a 10°C drop (floating setpoint based on ambient or NTC) or a drop of 100 (floating setpoint based on voltage or milliampere).
A	Active setpoint
B	Setpoint

■ **Floating setpoint based on ambient**

```
_ FLOATING SETPOINT
MODE:AMBIENT
MAXPOS:03.0°C NEG:00.0°C
RF:020.0°C SLOPE:006.0°C
```

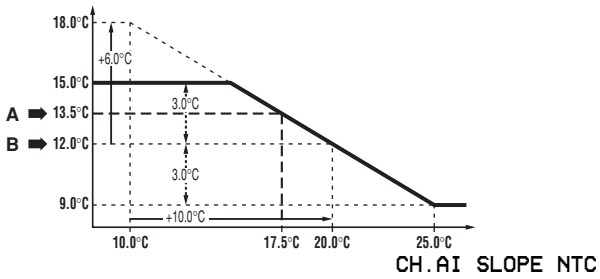
Example ambient = 17.5°C



■ **Floating setpoint based on NTC**

```
_ FLOATING SETPOINT
MODE:CH.AI SLOPE NTC
MAXPOS:03.0°C NEG:03.0°C
RF:020.0°C SLOPE:006.0°C
```

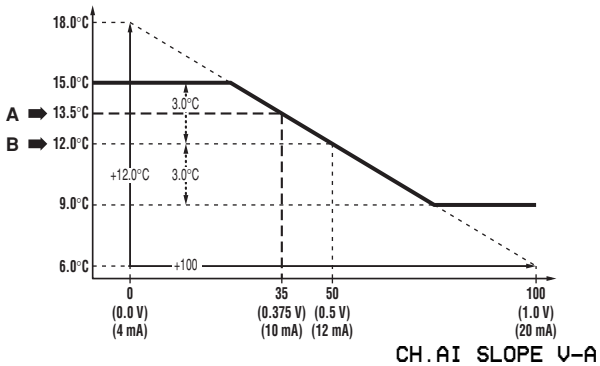
Example temperature = 17.5°C



■ **Floating setpoint based on Voltage or mAmpere**

```
_ FLOATING SETPOINT
MODE:CH.AI SLOPE V-A
MAXPOS:03.0°C NEG:03.0°C
RF:020.0°C SLOPE:012.0°C
```

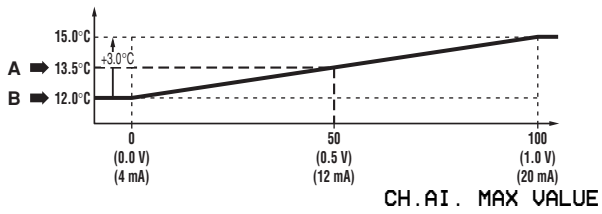
Example = 35 (0.375 V, 10 mA)



■ **Floating setpoint based on changeable analogue input**

```
_ FLOATING SETPOINT
MODE:CH.AI MAX VALUE
MAXIMUM VALUE:003.0°C
```

Example = 50 (0.5 V, 12 mA)



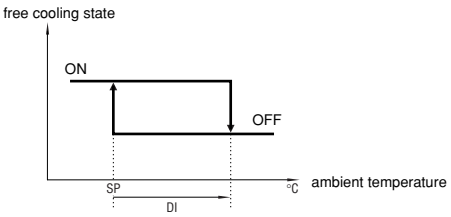
ANNEX III

Free cooling working

Legend

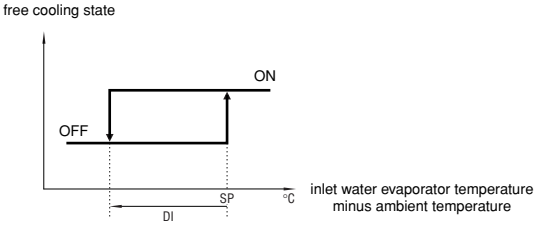
SP	Setpoint
DI	Differential

Free cooling on ambient temperature



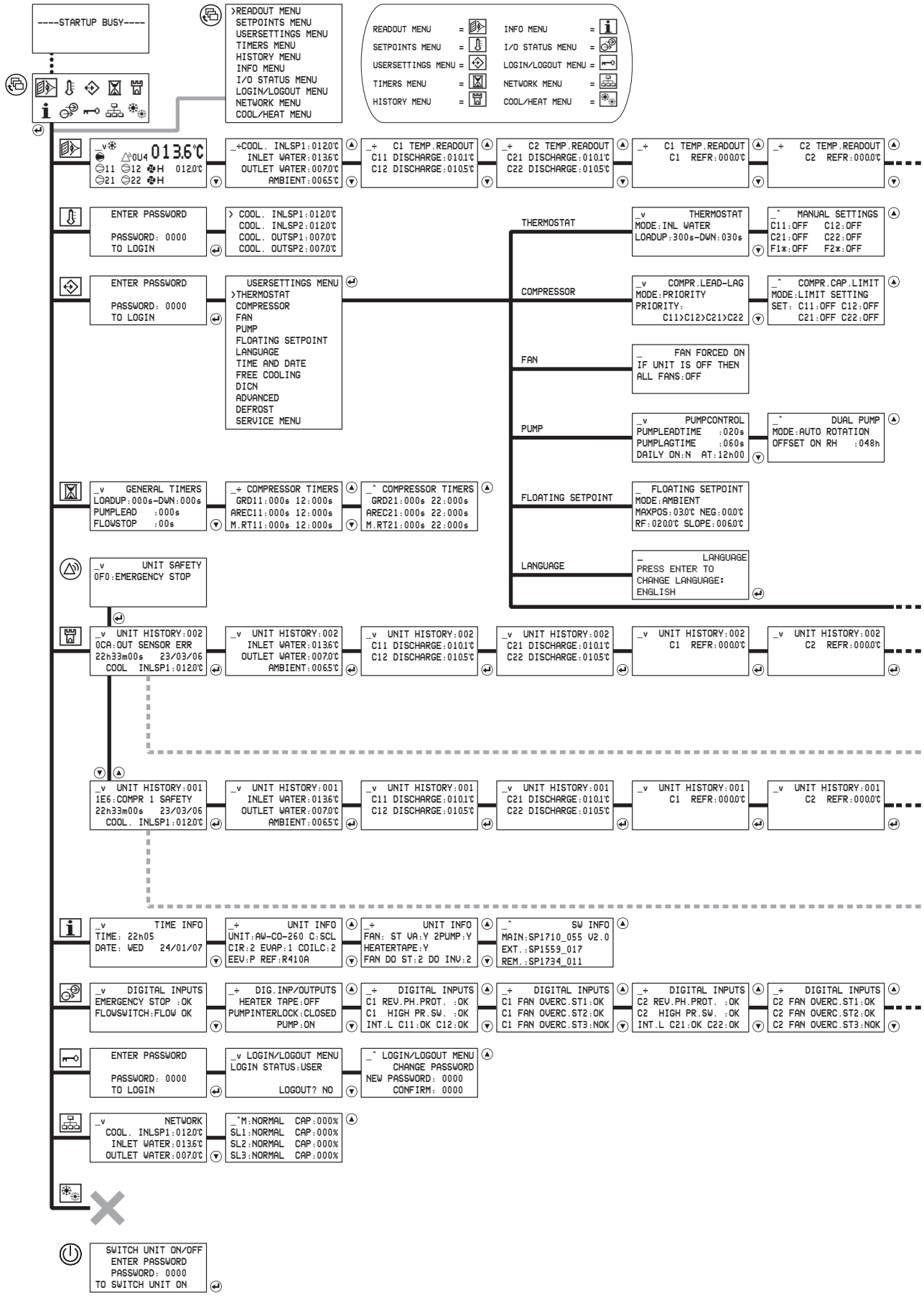
Free cooling		default	minimum	maximum
SP	(°C)	5.0°C	–30.0°C	25.0°C
DI	(°C)	1.0°C	1.0°C	5.0°C

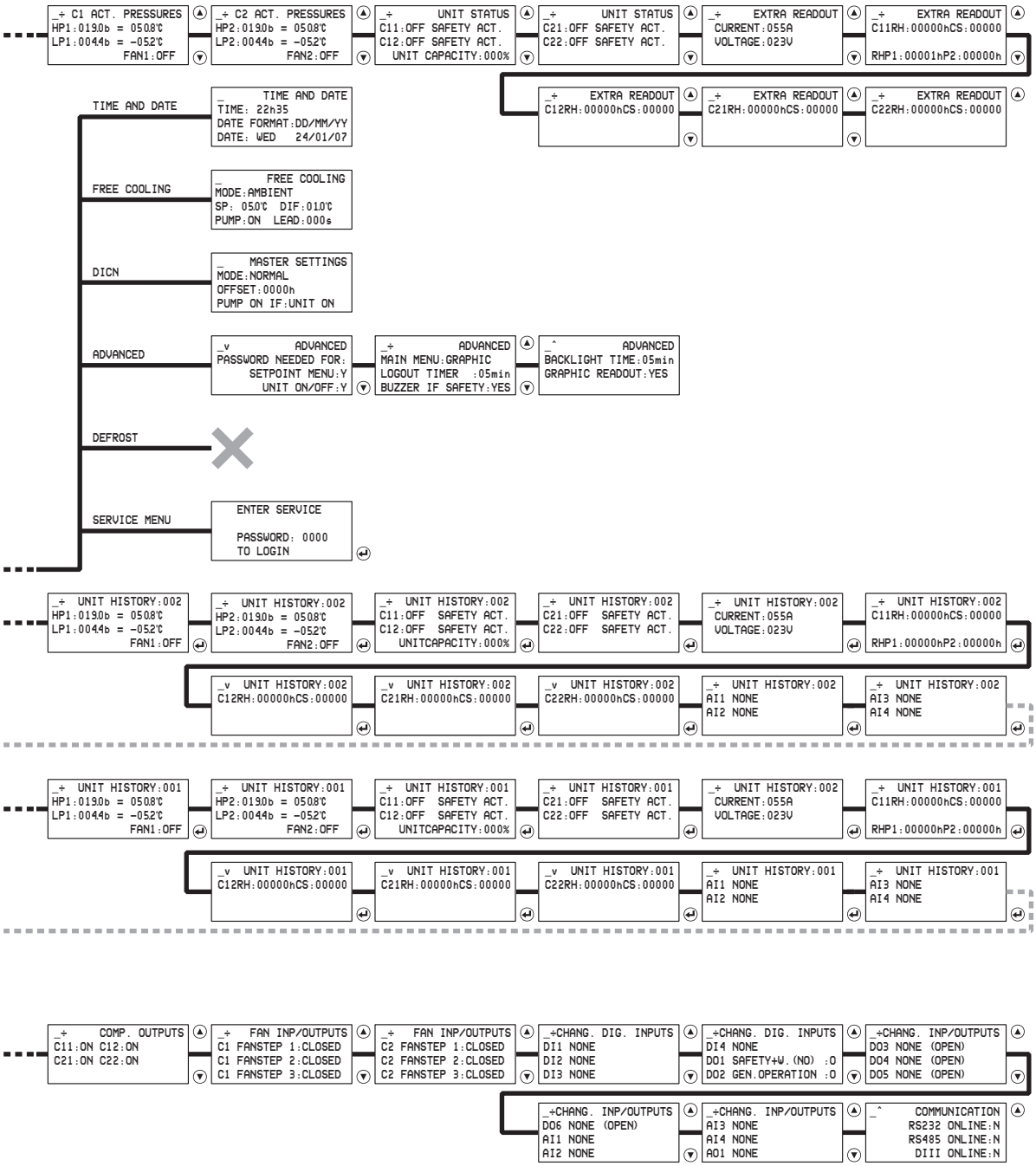
Free cooling on difference between inlet water evaporator temperature and ambient temperature



Free cooling		default	minimum	maximum
SP	(°C)	5.0°C	1.0°C	20.0°C
DI	(°C)	5.0°C	1.0°C	10.0°C

ANNEX IV


----STARTUP BUSY----
>READOUT MENU
SETPOINTS MENU
USERSETTINGS MENU
TIMERS MENU
HISTORY MENU
INFO MENU
I/O STATUS MENU
LOGIN/LOGOUT MENU
NETWORK MENU
COOL/HEAT MENU
READOUT MENU =
SETPOINTS MENU =
USERSETTINGS MENU =
TIMERS MENU =
HISTORY MENU =
INFO MENU =
I/O STATUS MENU =
LOGIN/LOGOUT MENU =
NETWORK MENU =
COOL/HEAT MENU =
013.6℃
_+COOL. INLSP1:012.0℃
INLET WATER:013.6℃
OUTLET WATER:007.0℃
AMBIENT:006.5℃
_÷ C1 TEMP.READOUT
C11 DISCHARGE:010.1℃
C12 DISCHARGE:010.5℃
_÷ C2 TEMP.READOUT
C21 DISCHARGE:010.1℃
C22 DISCHARGE:010.5℃
_÷ C1 TEMP.READOUT
C1 REFR:000.0℃
_÷ C2 TEMP.READOUT
C2 REFR:000.0℃
ENTER PASSWORD
PASSWORD: 0000
TO LOGIN
> COOL. INLSP1:012.0℃
COOL. INLSP2:012.0℃
COOL. OUTSP1:007.0℃
COOL. OUTSP2:007.0℃
USERSETTINGS MENU
>THERMOSTAT
COMPRESSOR
FAN
PUMP
FLOATING SETPOINT
LANGUAGE
TIME AND DATE
FREE COOLING
DICN
ADVANCED
DEFROST
SERVICE MENU
THERMOSTAT
_v THERMOSTAT
MODE:INL WATER
LOADUP:300s-DWN:030s
_^ MANUAL SETTINGS
C11:OFF C12:OFF
C21:OFF C22:OFF
F1✱:OFF F2✱:OFF
COMPRESSOR
_v COMPR.LEAD-LAG
MODE:PRIORITY
PRIORITY:
C11>C12>C21>C22
_^ COMPR.CAP.LIMIT
MODE:LIMIT SETTING
SET: C11:OFF C12:OFF
C21:OFF C22:OFF
FAN
_ FAN FORCED ON
IF UNIT IS OFF THEN
ALL FANS:OFF
PUMP
_v PUMPCONTROL
PUMPLEADTIME :020s
PUMPLAGTIME :060s
DAILY ON:N AT:12h00
_^ DUAL PUMP
MODE:AUTO ROTATION
OFFSET ON RH :048h
FLOATING SETPOINT
_ FLOATING SETPOINT
MODE:AMBIENT
MAXPOS:03.0℃ NEG:00.0℃
RF:02.0℃ SLOPE:006.0℃
LANGUAGE
_ LANGUAGE
PRESS ENTER TO
CHANGE LANGUAGE:
ENGLISH
_v GENERAL TIMERS
LOADUP:000s-DWN:000s
PUMPLEAD :000s
FLOWSTOP :00s
_÷ COMPRESSOR TIMERS
GRD11:000s 12:000s
AREC11:000s 12:000s
M.RT11:000s 12:000s
_^ COMPRESSOR TIMERS
GRD21:000s 22:000s
AREC21:000s 22:000s
M.RT21:000s 22:000s
_v UNIT SAFETY
0F0:EMERGENCY STOP
_v UNIT HISTORY:002
0CA:OUT SENSOR ERR
22h33m00s 23/03/06
COOL INLSP1:012.0℃
_v UNIT HISTORY:001
1E6:COMPR 1 SAFETY
22h33m00s 23/03/06
COOL. INLSP1:012.0℃
_v TIME INFO
TIME: 22h05
DATE: WED 24/01/07
_÷ UNIT INFO
UNIT:AW-CO-260 C:SCL
CIR:2 EVAP:1 COILC:2
EEV:P REF:R410A
_÷ UNIT INFO
FAN: ST VA:Y 2PUMP:Y
HEATERTAPE:Y
FAN DO ST:2 DO INV:2
_^ SW INFO
MAIN:SP1710_055 V2.0
EXT.:SP1559_017
REM.:SP1734_011
_v DIGITAL INPUTS
EMERGENCY STOP :OK
FLOWSWITCH:FLOW OK
_÷ DIG.INP/OUTPUTS
HEATER TAPE:OFF
PUMPINTERLOCK:CLOSED
PUMP:ON
_÷ DIGITAL INPUTS
C1 REV.PH.PROT. :OK
C1 HIGH PR.SW. :OK
INT.L C11:OK C12:OK
_÷ DIGITAL INPUTS
C1 FAN OVERC.ST1:OK
C1 FAN OVERC.ST2:OK
C1 FAN OVERC.ST3:NOK
_÷ DIGITAL INPUTS
C2 REV.PH.PROT. :OK
C2 HIGH PR.SW. :OK
INT.L C21:OK C22:OK
_÷ DIGITAL INPUTS
C2 FAN OVERC.ST1:OK
C2 FAN OVERC.ST2:OK
C2 FAN OVERC.ST3:NOK
ENTER PASSWORD
PASSWORD: 0000
TO LOGIN
_v LOGIN/LOGOUT MENU
LOGIN STATUS:USER
LOGOUT? NO
_^ LOGIN/LOGOUT MENU
CHANGE PASSWORD
NEW PASSWORD: 0000
CONFIRM: 0000
_v NETWORK
COOL. INLSP1:012.0℃
INLET WATER:013.6℃
OUTLET WATER:007.0℃
_^M:NORMAL CAP:000%
SL1:NORMAL CAP:000%
SL2:NORMAL CAP:000%
SL3:NORMAL CAP:000%
SWITCH UNIT ON/OFF
ENTER PASSWORD
PASSWORD: 0000
TO SWITCH UNIT ON


_÷ C1 ACT. PRESSURES
HP1:0190b = 0508℃
LP1:0044b = -052℃
FAN1:OFF
_÷ C2 ACT. PRESSURES
HP2:0190b = 0508℃
LP2:0044b = -052℃
FAN2:OFF
_÷ UNIT STATUS
C11:OFF SAFETY ACT.
C12:OFF SAFETY ACT.
UNIT CAPACITY:000%
_÷ UNIT STATUS
C21:OFF SAFETY ACT.
C22:OFF SAFETY ACT.
_÷ EXTRA READOUT
CURRENT:055A
VOLTAGE:023V
_÷ EXTRA READOUT
C11RH:00000hCS:00000
RHP1:00001hP2:00000h
_÷ EXTRA READOUT
C12RH:00000hCS:00000
_÷ EXTRA READOUT
C21RH:00000hCS:00000
_÷ EXTRA READOUT
C22RH:00000hCS:00000
TIME AND DATE
_ TIME AND DATE
TIME: 22h35
DATE FORMAT:DD/MM/YY
DATE: WED 24/01/07
FREE COOLING
_ FREE COOLING
MODE:AMBIENT
SP: 050℃ DIF:010℃
PUMP:ON LEAD:000s
DICN
_ MASTER SETTINGS
MODE:NORMAL
OFFSET:0000h
PUMP ON IF:UNIT ON
ADVANCED
_v ADVANCED
PASSWORD NEEDED FOR:
SETPOINT MENU:Y
UNIT ON/OFF:Y
_÷ ADVANCED
MAIN MENU:GRAPHIC
LOGOUT TIMER :05min
BUZZER IF SAFETY:YES
_^ ADVANCED
BACKLIGHT TIME:05min
GRAPHIC READOUT:YES
DEFROST
SERVICE MENU
ENTER SERVICE
PASSWORD: 0000
TO LOGIN
_÷ UNIT HISTORY:002
HP1:0190b = 0508℃
LP1:0044b = -052℃
FAN1:OFF
_÷ UNIT HISTORY:002
HP2:0190b = 0508℃
LP2:0044b = -052℃
FAN2:OFF
_÷ UNIT HISTORY:002
C11:OFF SAFETY ACT.
C12:OFF SAFETY ACT.
UNITCAPACITY:000%
_÷ UNIT HISTORY:002
C21:OFF SAFETY ACT.
C22:OFF SAFETY ACT.
_÷ UNIT HISTORY:002
CURRENT:055A
VOLTAGE:023V
_÷ UNIT HISTORY:002
C11RH:00000hCS:00000
RHP1:00000hP2:00000h
_v UNIT HISTORY:002
C12RH:00000hCS:00000
_v UNIT HISTORY:002
C21RH:00000hCS:00000
_v UNIT HISTORY:002
C22RH:00000hCS:00000
_÷ UNIT HISTORY:002
AI1 NONE
AI2 NONE
_÷ UNIT HISTORY:002
AI3 NONE
AI4 NONE
_÷ UNIT HISTORY:001
HP1:0190b = 0508℃
LP1:0044b = -052℃
FAN1:OFF
_÷ UNIT HISTORY:001
HP2:0190b = 0508℃
LP2:0044b = -052℃
FAN2:OFF
_÷ UNIT HISTORY:001
C11:OFF SAFETY ACT.
C12:OFF SAFETY ACT.
UNITCAPACITY:000%
_÷ UNIT HISTORY:001
C21:OFF SAFETY ACT.
C22:OFF SAFETY ACT.
_÷ UNIT HISTORY:002
CURRENT:055A
VOLTAGE:023V
_÷ UNIT HISTORY:001
C11RH:00000hCS:00000
RHP1:00000hP2:00000h
_v UNIT HISTORY:001
C12RH:00000hCS:00000
_v UNIT HISTORY:001
C21RH:00000hCS:00000
_v UNIT HISTORY:001
C22RH:00000hCS:00000
_÷ UNIT HISTORY:001
AI1 NONE
AI2 NONE
_÷ UNIT HISTORY:001
AI3 NONE
AI4 NONE
_÷ COMP. OUTPUTS
C11:ON C12:ON
C21:ON C22:ON
_÷ FAN INP/OUTPUTS
C1 FANSTEP 1:CLOSED
C1 FANSTEP 2:CLOSED
C1 FANSTEP 3:CLOSED
_÷ FAN INP/OUTPUTS
C2 FANSTEP 1:CLOSED
C2 FANSTEP 2:CLOSED
C2 FANSTEP 3:CLOSED
_÷CHANG. DIG. INPUTS
DI1 NONE
DI2 NONE
DI3 NONE
_÷CHANG. DIG. INPUTS
DI4 NONE
DO1 SAFETY+W.(NO) :O
DO2 GEN.OPERATION :O
_÷CHANG. INP/OUTPUTS
DO3 NONE (OPEN)
DO4 NONE (OPEN)
DO5 NONE (OPEN)
_÷CHANG. INP/OUTPUTS
DO6 NONE (OPEN)
AI1 NONE
AI2 NONE
_÷CHANG. INP/OUTPUTS
AI3 NONE
AI4 NONE
AO1 NONE
_^ COMMUNICATION
RS232 ONLINE:N
RS485 ONLINE:N
DIII ONLINE:N

Copyright © Daikin

DAIKIN EUROPE N.V.

Zandvoordestraat 300, B-8400 Oostende, Belgium

4PW35556-1C